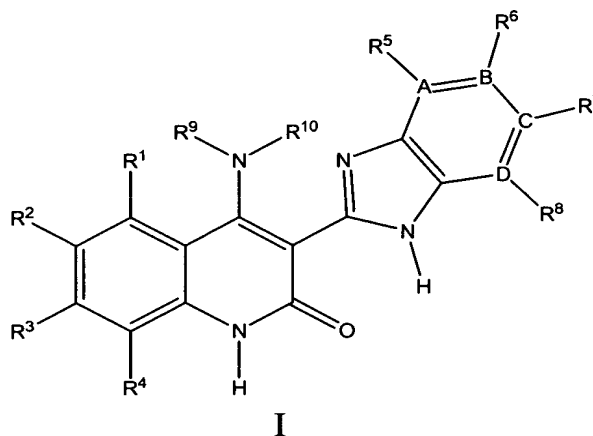


## CLAIMS

What is claimed is:

1                    1.        A method of inhibiting a serine/threonine kinase in a  
2        subject or treating a biological condition mediated by a serine/threonine  
3        kinase in a subject, comprising: administering to the subject a compound of  
4        Structure I, a tautomer of the compound, a pharmaceutically acceptable salt  
5        of the compound, a pharmaceutically acceptable salt of the tautomer, or  
6        mixtures thereof wherein Structure I has the following formula



wherein,

A, B, C, and D are independently selected from the group  
consisting carbon and nitrogen;

R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
-CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
from 1 to 12 carbon atoms, substituted and unsubstituted  
alkenyl groups having from 1 to 12 carbon atoms, substituted  
and unsubstituted alkynyl groups having from 1 to 8 carbon  
atoms, substituted and unsubstituted heterocyclyl groups,  
substituted and unsubstituted heterocyclylalkyl groups, -SH,

18 substituted and unsubstituted -S-alkyl groups, substituted and  
19 unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
20 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
21 unsubstituted -S(=O)-alkyl groups, -S(=O)-NH<sub>2</sub>, substituted and  
22 unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and  
23 unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
24 unsubstituted alkoxy groups, substituted and unsubstituted  
25 aryloxy groups, substituted and unsubstituted arylalkoxy groups,  
26 substituted and unsubstituted heterocyclyloxy groups,  
27 substituted and unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>,  
28 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
29 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
30 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
31 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
32 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
33 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
34 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
35 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
36 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
37 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
38 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
39 and unsubstituted -N(H)-S(=O)-alkyl groups, substituted and  
40 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
41 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
42 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
43 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
44 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
45 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
46 unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
47 -C(=O)-N(H)(heterocyclylalkyl) groups, -CO<sub>2</sub>H, substituted and  
48 unsubstituted -C(=O)-O-alkyl groups, substituted and

49 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
50 and unsubstituted -C(=O)-O-heterocyclylalkyl groups;

51  $R^2$  and  $R^3$  are independently selected from the group consisting  
52 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
53 alkyl groups having from 1 to 12 carbon atoms, substituted and  
54 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
55 substituted and unsubstituted alkynyl groups having from 1 to 8  
56 carbon atoms, substituted and unsubstituted aryl groups,  
57 substituted and unsubstituted aralkyl groups, substituted and  
58 unsubstituted heterocyclyl groups, substituted and unsubstituted  
59 heterocyclylalkyl groups, -SH, substituted and unsubstituted -S-  
60 alkyl groups, substituted and unsubstituted -S-aryl groups,  
61 substituted and unsubstituted -S-aralkyl groups, substituted and  
62 unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
63 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
64 unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
65 unsubstituted -S(=O)-alkyl groups, substituted and unsubstituted  
66 -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
67 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
68 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, substituted and  
69 unsubstituted -S(=O)<sub>2</sub>-N(H)(aryl) groups, substituted and  
70 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)(aryl) groups, substituted and  
71 unsubstituted -S(=O)<sub>2</sub>-N(aryl)<sub>2</sub> groups, substituted and  
72 unsubstituted -S(=O)<sub>2</sub>-N(H)(aralkyl) groups, substituted and  
73 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)(aralkyl) groups, substituted and  
74 unsubstituted -S(=O)<sub>2</sub>-N(aralkyl)<sub>2</sub> groups, -OH, substituted and  
75 unsubstituted alkoxy groups, substituted and unsubstituted  
76 aryloxy groups, substituted and unsubstituted arylalkoxy groups,  
77 substituted and unsubstituted heterocyclyloxy groups,  
78 substituted and unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>,  
79 substituted and unsubstituted -N(H)(alkyl) groups, substituted

80 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
81 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
82 -N(alkyl)(aryl) groups, substituted and unsubstituted -N(aryl)<sub>2</sub>  
83 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
84 substituted and unsubstituted -N(alkyl)(aralkyl) groups,  
85 substituted and unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted  
86 and unsubstituted -N(H)(heterocyclyl) groups, substituted and  
87 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
88 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
89 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
90 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
91 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
92 unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
93 unsubstituted -N(H)-S(=O)<sub>2</sub>-aryl groups, substituted and  
94 unsubstituted -N(H)-S(=O)<sub>2</sub>-aralkyl groups, substituted and  
95 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
96 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclylalkyl groups, substituted  
97 and unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
98 unsubstituted -N(H)-C(=O)-aryl groups, substituted and  
99 unsubstituted -N(H)-C(=O)-aralkyl groups, substituted and  
100 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
101 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
102 and unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
103 unsubstituted -N(alkyl)-C(=O)-aryl groups, substituted and  
104 unsubstituted -N(alkyl)-C(=O)-aralkyl groups, substituted and  
105 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
106 and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl groups,  
107 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-alkyl groups,  
108 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-aryl groups,  
109 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-aralkyl groups,  
110 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocyclyl  
111 groups, substituted and unsubstituted

112 -N(alkyl)-S(=O)<sub>2</sub>-heterocyclalkyl groups, -N(H)-C(=O)-NH<sub>2</sub>,  
113 substituted and unsubstituted -N(H)-C(=O)-N(H)(alkyl) groups,  
114 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)<sub>2</sub> groups,  
115 substituted and unsubstituted -N(H)-C(=O)-N(H)(aryl) groups,  
116 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)(aryl) groups,  
117 substituted and unsubstituted -N(H)-C(=O)-N(aryl)<sub>2</sub> groups,  
118 substituted and unsubstituted -N(H)-C(=O)-N(H)(aralkyl) groups,  
119 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)(aralkyl)  
120 groups, substituted and unsubstituted -N(H)-C(=O)-N(aralkyl)<sub>2</sub>  
121 groups, substituted and unsubstituted  
122 -N(H)-C(=O)-N(H)(heterocyclyl) groups, substituted and  
123 unsubstituted -N(H)-C(=O)-N(alkyl)(heterocyclyl) groups,  
124 substituted and unsubstituted -N(H)-C(=O)-N(heterocyclyl)<sub>2</sub>  
125 groups, substituted and unsubstituted  
126 -N(H)-C(=O)-N(H)(heterocyclalkyl) groups, substituted and  
127 unsubstituted -N(H)-C(=O)-N(alkyl)(heterocyclalkyl) groups,  
128 substituted and unsubstituted -N(H)-C(=O)-N(heterocyclalkyl)<sub>2</sub>  
129 groups, substituted and unsubstituted -N(alkyl)-C(=O)-NH<sub>2</sub>  
130 groups, substituted and unsubstituted  
131 -N(alkyl)-C(=O)-N(H)(alkyl) groups, substituted and  
132 unsubstituted -N(alkyl)-C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
133 unsubstituted -N(alkyl)-C(=O)-N(H)(aryl) groups, substituted and  
134 unsubstituted -N(alkyl)-C(=O)-N(alkyl)(aryl) groups, substituted  
135 and unsubstituted -N(alkyl)-C(=O)-N(aryl)<sub>2</sub> groups, substituted  
136 and unsubstituted -N(alkyl)-C(=O)-N(H)(aralkyl) groups,  
137 substituted and unsubstituted -N(alkyl)-C(=O)-N(alkyl)(aralkyl)  
138 groups, substituted and unsubstituted  
139 -N(alkyl)-C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
140 unsubstituted -N(alkyl)-C(=O)-N(H)(heterocyclyl) groups,  
141 substituted and unsubstituted  
142 -N(alkyl)-C(=O)-N(alkyl)(heterocyclyl) groups, substituted and  
143 unsubstituted -N(alkyl)-C(=O)-N(heterocyclyl)<sub>2</sub> groups,

- 144 substituted and unsubstituted
- 145 -N(alkyl)-C(=O)-N(H)(heterocyclalkyl) groups, substituted and
- 146 unsubstituted -N(alkyl)-C(=O)-N(alkyl)(heterocyclalkyl) groups,
- 147 substituted and unsubstituted
- 148 -N(alkyl)-C(=O)-N(heterocyclalkyl)<sub>2</sub> groups, substituted and
- 149 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted
- 150 -C(=O)-aryl groups, substituted and unsubstituted -C(=O)-aralkyl
- 151 groups, substituted and unsubstituted -C(=O)-heterocycl
- 152 groups, substituted and unsubstituted -C(=O)-heterocyclalkyl
- 153 groups, -C(=O)-NH<sub>2</sub>, substituted and unsubstituted
- 154 -C(=O)-N(H)(alkyl) groups, substituted and unsubstituted
- 155 -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and unsubstituted
- 156 -C(=O)-N(H)(aryl) groups, substituted and unsubstituted
- 157 -C(=O)-N(alkyl)(aryl) groups, substituted and unsubstituted
- 158 -C(=O)-N(aryl)<sub>2</sub> groups, substituted and unsubstituted
- 159 -C(=O)-N(H)(aralkyl) groups, substituted and unsubstituted
- 160 -C(=O)-N(alkyl)(aralkyl) groups, substituted and unsubstituted
- 161 -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and unsubstituted
- 162 -C(=O)-N(H)(heterocycl) groups, substituted and unsubstituted
- 163 -C(=O)-N(alkyl)(heterocycl) groups, substituted and
- 164 unsubstituted -C(=O)-N(heterocycl)<sub>2</sub> groups, substituted and
- 165 unsubstituted -C(=O)-N(H)(heterocyclalkyl) groups, substituted
- 166 and unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl) groups,
- 167 substituted and unsubstituted -C(=O)-N(heterocyclalkyl)<sub>2</sub>
- 168 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl
- 169 groups, substituted and unsubstituted -C(=O)-O-aryl groups,
- 170 substituted and unsubstituted -C(=O)-O-heterocycl groups,
- 171 and substituted and unsubstituted -C(=O)-O-heterocyclalkyl
- 172 groups;
- 173 R<sup>4</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,
- 174 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having

175 from 1 to 12 carbon atoms, substituted and unsubstituted  
176 alkenyl groups having from 1 to 8 carbon atoms, substituted and  
177 unsubstituted alkynyl groups having from 1 to 8 carbon atoms,  
178 -SH, substituted and unsubstituted -S-alkyl groups, substituted  
179 and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
180 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
181 unsubstituted -S(=O)-alkyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
182 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
183 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
184 unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and  
185 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
186 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
187 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
188 -N(H)-S(=O)-alkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
189 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
190 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, and substituted and  
191 unsubstituted -C(=O)-O-alkyl groups;

192 R<sup>5</sup> and R<sup>8</sup> are independently selected from the group consisting  
193 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
194 straight and branched chain alkyl groups having from 1 to 8  
195 carbon atoms, substituted and unsubstituted alkenyl groups  
196 having from 1 to 8 carbon atoms, substituted and unsubstituted  
197 alkynyl groups having from 1 to 8 carbon atoms, substituted and  
198 unsubstituted heterocyclyl groups, -SH, substituted and  
199 unsubstituted -S-alkyl groups, substituted and unsubstituted  
200 -S(=O)<sub>2</sub>-O-alkyl groups, substituted and unsubstituted  
201 -S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted -S(=O)-alkyl  
202 groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and unsubstituted  
203 -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and unsubstituted  
204 -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and unsubstituted  
205 alkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl)

206 groups, substituted and unsubstituted -N(alkyl)<sub>2</sub> groups,  
207 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
208 substituted and unsubstituted -N(H)-S(=O)-alkyl groups,  
209 -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)  
210 groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
211 and substituted and unsubstituted -C(=O)-O-alkyl groups; or R<sup>5</sup>  
212 may be absent if A is nitrogen; or R<sup>8</sup> may be absent if D is  
213 nitrogen;

214 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
215 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
216 alkyl groups having from 1 to 12 carbon atoms, substituted and  
217 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
218 substituted and unsubstituted alkynyl groups having from 1 to 8  
219 carbon atoms, substituted and unsubstituted heterocyclyl  
220 groups, substituted and unsubstituted heterocyclylalkyl groups,  
221 -SH, substituted and unsubstituted -S-alkyl groups, substituted  
222 and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
223 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
224 unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
225 unsubstituted -S(=O)-alkyl groups, substituted and unsubstituted  
226 -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
227 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
228 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, substituted and  
229 unsubstituted -S(=O)<sub>2</sub>-N(H)(heterocyclyl) groups, substituted  
230 and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)(heterocyclyl) groups,  
231 substituted and unsubstituted -S(=O)<sub>2</sub>-N(heterocyclyl)<sub>2</sub> groups,  
232 substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(heterocyclylalkyl)  
233 groups, substituted and unsubstituted  
234 -S(=O)<sub>2</sub>-N(alkyl)(heterocyclylalkyl) groups, substituted and  
235 unsubstituted -S(=O)<sub>2</sub>-N(heterocyclylalkyl)<sub>2</sub> groups, -OH,  
236 substituted and unsubstituted alkoxy groups, substituted and



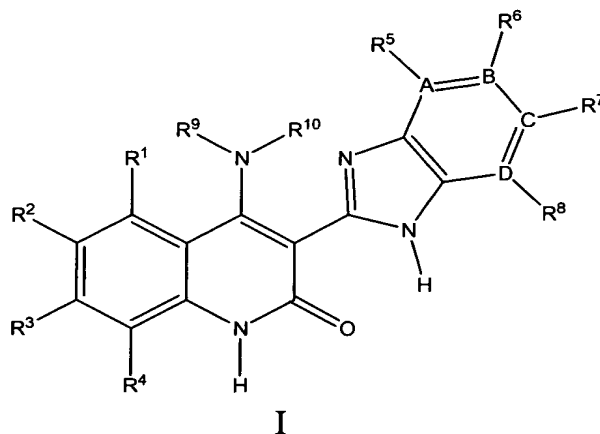
237 unsubstituted aryloxy groups, substituted and unsubstituted  
238 arylalkoxy groups, substituted and unsubstituted heterocyclyloxy  
239 groups, substituted and unsubstituted heterocyclylalkoxy  
240 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
241 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
242 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
243 -N(alkyl)(aryl) groups, substituted and unsubstituted -N(aryl)<sub>2</sub>  
244 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
245 substituted and unsubstituted -N(alkyl)(aralkyl) groups,  
246 substituted and unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted  
247 and unsubstituted -N(H)(heterocyclyl) groups, substituted and  
248 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
249 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
250 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
251 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
252 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
253 unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
254 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
255 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclylalkyl groups, substituted  
256 and unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
257 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
258 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
259 and unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
260 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
261 and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl groups,  
262 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-alkyl groups,  
263 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocyclyl  
264 groups, substituted and unsubstituted  
265 -N(alkyl)-S(=O)<sub>2</sub>-heterocyclylalkyl groups, substituted and  
266 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
267 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
268 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and

269 unsubstituted  $-C(=O)-N(H)(alkyl)$  groups, substituted and  
270 unsubstituted  $-C(=O)-N(alkyl)_2$  groups, substituted and  
271 unsubstituted  $-C(=O)-N(H)(aryl)$  groups, substituted and  
272 unsubstituted  $-C(=O)-N(alkyl)(aryl)$  groups, substituted and  
273 unsubstituted  $-C(=O)-N(aryl)_2$  groups, substituted and  
274 unsubstituted  $-C(=O)-N(H)(aralkyl)$  groups, substituted and  
275 unsubstituted  $-C(=O)-N(alkyl)(aralkyl)$  groups, substituted and  
276 unsubstituted  $-C(=O)-N(aralkyl)_2$  groups, substituted and  
277 unsubstituted  $-C(=O)-N(H)(heterocyclyl)$  groups, substituted and  
278 unsubstituted  $-C(=O)-N(alkyl)(heterocyclyl)$  groups, substituted  
279 and unsubstituted  $-C(=O)-N(heterocyclyl)_2$  groups, substituted  
280 and unsubstituted  $-C(=O)-N(H)(heterocyclalkyl)$  groups,  
281 substituted and unsubstituted  $-C(=O)-N(alkyl)(heterocyclalkyl)$   
282 groups, substituted and unsubstituted  
283  $-C(=O)-N(heterocyclalkyl)_2$  groups,  $-CO_2H$ , substituted and  
284 unsubstituted  $-C(=O)-O-alkyl$  groups, substituted and  
285 unsubstituted  $-C(=O)-O-heterocyclyl$  groups, and substituted  
286 and unsubstituted  $-C(=O)-O-heterocyclalkyl$  groups; or  $R^6$  may  
287 be absent if B is nitrogen; or  $R^7$  may be absent if C is nitrogen;

288  $R^9$  is selected from the group consisting of  $-H$ , substituted and  
289 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
290 substituted and unsubstituted aryl groups, substituted and  
291 unsubstituted aralkyl groups, substituted and unsubstituted  
292 heterocyclyl groups, substituted and unsubstituted  
293 heterocyclalkyl groups, substituted and unsubstituted  
294 heterocyclaminoalkyl groups, substituted and unsubstituted  
295 alkoxy groups, and  $-NH_2$ , or  $R^9$  and  $R^{10}$  join together to form one  
296 or more rings, each having 5, 6, or 7 ring members; and  
297  $R^{10}$  is  $-H$ , or  $R^9$  and  $R^{10}$  join together to form one or more rings,  
298 each having 5, 6, or 7 ring members.

2. The method of claim 1, wherein the serine/threonine kinase is glycogen synthase kinase 3, cyclin dependent kinase 2, cyclin dependent kinase 4, checkpoint kinase 1, NEK-2, CHK2, MEK1, CK1 $\epsilon$ , Raf, ribosomal S6 kinase 2, or PAR-1.

3. A method of inhibiting a serine/threonine kinase in a subject or treating a biological condition mediated by a serine/threonine kinase in a subject, comprising: administering to the subject a compound of Structure I, a tautomer of the compound, a pharmaceutically acceptable salt of the compound, a pharmaceutically acceptable salt of the tautomer, or mixtures thereof wherein Structure I has the following formula and the serine/threonine kinase is glycogen synthase kinase 3



wherein,

A, B, C, and D are independently selected from the group consisting of carbon and nitrogen;

R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted straight and branched chain alkyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted alkenyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted alkynyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted heterocyclyl

18 groups, -SH, substituted and unsubstituted -S-alkyl groups,  
19 substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups,  
20 substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted  
21 and unsubstituted -S(=O)-alkyl groups, -S(=O)-NH<sub>2</sub>, substituted  
22 and unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and  
23 unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
24 unsubstituted alkoxy groups, substituted and unsubstituted  
25 heterocyclyloxy groups, substituted and unsubstituted  
26 heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
27 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
28 groups, substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
29 substituted and unsubstituted -N(H)-S(=O)-alkyl groups,  
30 -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)  
31 groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
32 substituted and unsubstituted -C(=O)-N(H)(aralkyl) groups,  
33 -CO<sub>2</sub>H, and substituted and unsubstituted -C(=O)-O-alkyl  
34 groups;

35 R<sup>2</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
36 -CN, -NO<sub>2</sub>, substituted and unsubstituted straight and branched  
37 chain alkyl groups having from 1 to 8 carbon atoms, substituted  
38 and unsubstituted alkenyl groups having from 1 to 8 carbon  
39 atoms, substituted and unsubstituted alkynyl groups having from  
40 1 to 8 carbon atoms, substituted and unsubstituted cycloalkyl  
41 groups, substituted and unsubstituted cycloalkenyl groups,  
42 substituted and unsubstituted aryl groups, substituted and  
43 unsubstituted heterocyclyl groups, -SH, substituted and  
44 unsubstituted -S-alkyl groups, substituted and unsubstituted  
45 -S(=O)<sub>2</sub>-O-alkyl groups, substituted and unsubstituted  
46 -S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
47 -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and unsubstituted  
48 -S(=O)-alkyl groups, substituted and unsubstituted

49 -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
50 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
51 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
52 unsubstituted alkoxy groups, substituted and unsubstituted  
53 heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
54 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
55 groups, substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
56 substituted and unsubstituted -N(H)-C(=O)-heterocyclyl groups,  
57 substituted and unsubstituted -N(H)-S(=O)-alkyl groups,  
58 substituted and unsubstituted -N(H)-S(=O)-heterocyclyl groups,  
59 -N(alkyl)-C(=O)-alkyl groups, substituted and unsubstituted  
60 -N(alkyl)-C(=O)-heterocyclyl groups, substituted and  
61 unsubstituted -N(alkyl)-S(=O)-alkyl groups, substituted and  
62 unsubstituted -N(alkyl)-S(=O)-heterocyclyl groups,  
63 -N(H)-C(=O)-NH<sub>2</sub>, substituted and unsubstituted  
64 -N(H)-C(=O)-N(H)(alkyl) groups, substituted and unsubstituted  
65 -N(H)-C(=O)-N(alkyl)<sub>2</sub> groups, -N(alkyl)-C(=O)-NH<sub>2</sub>, substituted  
66 and unsubstituted -N(alkyl)-C(=O)-N(H)(alkyl) groups,  
67 substituted and unsubstituted -N(alkyl)-C(=O)-N(alkyl)<sub>2</sub> groups,  
68 -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)  
69 groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
70 substituted and unsubstituted -C(=O)-alkyl groups, substituted  
71 and unsubstituted -C(=O)-heterocyclyl groups, -CO<sub>2</sub>H, and  
72 substituted and unsubstituted -C(=O)-O-alkyl groups; or R<sup>2</sup> and  
73 R<sup>3</sup> may join together to form a cyclic group;

74 R<sup>3</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
75 -CN, -NO<sub>2</sub>, substituted and unsubstituted straight and branched  
76 chain alkyl groups having from 1 to 8 carbon atoms, substituted  
77 and unsubstituted alkenyl groups having from 1 to 8 carbon  
78 atoms, substituted and unsubstituted alkynyl groups having from  
79 1 to 8 carbon atoms, substituted and unsubstituted aryl groups,

80 substituted and unsubstituted aralkyl groups, substituted and  
81 unsubstituted heterocyclyl groups, substituted and unsubstituted  
82 heterocyclylalkyl groups, -SH, substituted and unsubstituted -S-  
83 alkyl groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl  
84 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups,  
85 substituted and unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups,  
86 substituted and unsubstituted -S(=O)-alkyl groups, substituted  
87 and unsubstituted -S(=O)-heterocyclyl groups, -S(=O)-NH<sub>2</sub>,  
88 substituted and unsubstituted -S(=O)-N(H)(alkyl) groups,  
89 substituted and unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -OH,  
90 substituted and unsubstituted alkoxy groups, substituted and  
91 unsubstituted heterocyclyoxy groups, substituted and  
92 unsubstituted heterocyclylalkoxy groups, substituted and  
93 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
94 -N(H)(cycloalkyl) groups, substituted and unsubstituted  
95 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
96 -N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
97 -N(alkyl)<sub>2</sub> groups, -NH<sub>2</sub>, substituted and unsubstituted  
98 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
99 -N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted  
100 -N(H)-S(=O)-alkyl groups, substituted and unsubstituted  
101 -N(H)-S(=O)-heterocyclyl groups, substituted and unsubstituted  
102 -N(alkyl)-C(=O)-alkyl groups, substituted and unsubstituted  
103 -N(alkyl)-C(=O)-heterocyclyl groups, substituted and  
104 unsubstituted -N(alkyl)-S(=O)-alkyl groups, substituted and  
105 unsubstituted -N(alkyl)-S(=O)-heterocyclyl groups,  
106 -N(H)-C(=O)-NH<sub>2</sub>, substituted and unsubstituted  
107 -N(H)-C(=O)-N(H)(alkyl) groups, substituted and unsubstituted  
108 -N(H)-C(=O)-N(alkyl)<sub>2</sub> groups, -N(alkyl)-C(=O)-NH<sub>2</sub>, substituted  
109 and unsubstituted -N(alkyl)-C(=O)-N(H)(alkyl) groups substituted  
110 and unsubstituted -N(alkyl)-C(=O)-N(alkyl)<sub>2</sub> groups, substituted  
111 and unsubstituted -C(=O)-alkyl groups, substituted and

112 unsubstituted -C(=O)-heterocyclyl groups, -C(=O)-NH<sub>2</sub> groups,  
113 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
114 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
115 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
116 substituted and unsubstituted -C(=O)-N(H)(aryl) groups, -CO<sub>2</sub>H,  
117 and substituted and unsubstituted -C(=O)-O-alkyl groups, or R<sup>2</sup>  
118 and R<sup>3</sup> may join together to form a cyclic group;

119 R<sup>4</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
120 -CN, -NO<sub>2</sub>, substituted and unsubstituted straight and branched  
121 chain alkyl groups having from 1 to 8 carbon atoms, substituted  
122 and unsubstituted alkenyl groups having from 1 to 8 carbon  
123 atoms, substituted and unsubstituted alkynyl groups having from  
124 1 to 8 carbon atoms, -SH, substituted and unsubstituted -S-alkyl  
125 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups,  
126 substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted  
127 and unsubstituted -S(=O)-alkyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted  
128 and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
129 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
130 unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and  
131 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
132 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
133 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
134 -N(H)-S(=O)-alkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
135 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
136 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, and substituted and  
137 unsubstituted -C(=O)-O-alkyl groups;

138 R<sup>5</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
139 -CN, -NO<sub>2</sub>, substituted and unsubstituted straight and branched  
140 chain alkyl groups having from 1 to 8 carbon atoms, substituted  
141 and unsubstituted alkenyl groups having from 1 to 8 carbon  
142 atoms, substituted and unsubstituted alkynyl groups having from

143 1 to 8 carbon atoms, substituted and unsubstituted heterocyclyl  
144 groups, -SH, substituted and unsubstituted -S-alkyl groups,  
145 substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups,  
146 substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted  
147 and unsubstituted -S(=O)-alkyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted  
148 and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
149 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
150 unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and  
151 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
152 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
153 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
154 -N(H)-S(=O)-alkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
155 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
156 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, and substituted and  
157 unsubstituted -C(=O)-O-alkyl groups; or R<sup>5</sup> may be absent if A is  
158 nitrogen;

159 R<sup>6</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
160 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
161 from 1 to 8 carbon atoms, substituted and unsubstituted alkenyl  
162 groups having from 1 to 8 carbon atoms, substituted and  
163 unsubstituted alkynyl groups having from 1 to 8 carbon atoms,  
164 substituted and unsubstituted heterocyclyl groups, -SH,  
165 substituted and unsubstituted -S-alkyl groups, substituted and  
166 unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
167 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
168 unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
169 unsubstituted -S(=O)-alkyl groups, substituted and unsubstituted  
170 -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
171 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
172 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
173 unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and



- 174 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
175 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
176 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
177 -N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
178 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
179 -N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted  
180 -N(alkyl)-C(=O)-alkyl groups, substituted and unsubstituted  
181 -N(alkyl)-C(=O)-heterocyclyl groups, substituted and  
182 unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
183 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
184 unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
185 unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocyclyl groups, substituted  
186 and unsubstituted -C(=O)-alkyl groups, substituted and  
187 unsubstituted -C(=O)-heterocyclyl groups, -C(=O)-NH<sub>2</sub>,  
188 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
189 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, -CO<sub>2</sub>H,  
190 and substituted and unsubstituted -C(=O)-O-alkyl groups; or R<sup>6</sup>  
191 may be absent if B is nitrogen;
- 192 R<sup>7</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
193 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
194 from 1 to 8 carbon atoms, substituted and unsubstituted alkenyl  
195 groups having from 1 to 8 carbon atoms, substituted and  
196 unsubstituted alkynyl groups having from 1 to 8 carbon atoms,  
197 substituted and unsubstituted heterocyclyl groups, substituted  
198 and unsubstituted heterocyclylalkyl groups, -SH, substituted and  
199 unsubstituted -S-alkyl groups, substituted and unsubstituted  
200 -S(=O)<sub>2</sub>-O-alkyl groups, substituted and unsubstituted  
201 -S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
202 -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and unsubstituted  
203 -S(=O)-alkyl groups, substituted and unsubstituted  
204 -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and

205 unsubstituted  $-S(=O)_2-N(H)(alkyl)$  groups, substituted and  
206 unsubstituted  $-S(=O)_2-N(alkyl)_2$  groups,  $-OH$ , substituted and  
207 unsubstituted alkoxy groups,  $-NH_2$ , substituted and  
208 unsubstituted  $-N(H)(alkyl)$  groups, substituted and unsubstituted  
209  $-N(alkyl)_2$  groups, substituted and unsubstituted  
210  $-N(H)(heterocyclyl)$  groups, substituted and unsubstituted  
211  $-N(alkyl)(heterocyclyl)$  groups, substituted and unsubstituted  
212  $-N(H)-C(=O)-alkyl$  groups, substituted and unsubstituted  
213  $-N(H)-C(=O)-heterocyclyl$  groups, substituted and unsubstituted  
214  $-N(alkyl)-C(=O)-alkyl$  groups, substituted and unsubstituted  
215  $-N(alkyl)-C(=O)-heterocyclyl$  groups, substituted and  
216 unsubstituted  $-N(H)-S(=O)-alkyl$  groups, substituted and  
217 unsubstituted  $-N(H)-S(=O)-heterocyclyl$  groups, substituted and  
218 unsubstituted  $-N(alkyl)-S(=O)-alkyl$  groups, substituted and  
219 unsubstituted  $-N(alkyl)-S(=O)-heterocyclyl$  groups, substituted  
220 and unsubstituted amidine groups,  $-C(=O)-NH_2$ , substituted and  
221 unsubstituted  $-C(=O)-N(H)(alkyl)$  groups, substituted and  
222 unsubstituted  $-C(=O)-N(alkyl)_2$  groups, substituted and  
223 unsubstituted  $-C(=O)-N(H)(heterocyclyl)$  groups, substituted and  
224 unsubstituted  $-C(=O)-N(H)(alkyl)(heterocyclyl)$  groups,  
225 substituted and unsubstituted  $-C(=O)-N(heterocyclyl)_2$  groups,  
226 substituted and unsubstituted  $-C(=O)-alkyl$  groups, substituted  
227 and unsubstituted  $-C(=O)-heterocyclyl$  groups,  $-CO_2H$ , and  
228 substituted and unsubstituted  $-C(=O)-O-alkyl$  groups; or  $R^7$  may  
229 be absent if C is nitrogen;

230  $R^8$  is selected from the group consisting of  $-H$ ,  $-F$ ,  $-Cl$ ,  $-Br$ ,  $-I$ ,  
231  $-CN$ ,  $-NO_2$ , substituted and unsubstituted straight and branched  
232 chain alkyl groups having from 1 to 8 carbon atoms, substituted  
233 and unsubstituted alkenyl groups having from 1 to 8 carbon  
234 atoms, substituted and unsubstituted alkynyl groups having from  
235 1 to 8 carbon atoms, substituted and unsubstituted heterocyclyl

236 groups, -SH, substituted and unsubstituted -S-alkyl groups,  
237 substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups,  
238 substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted  
239 and unsubstituted -S(=O)-alkyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted  
240 and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
241 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
242 unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and  
243 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
244 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
245 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
246 -N(H)-S(=O)<sub>2</sub>-alkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
247 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
248 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, and substituted and  
249 unsubstituted -C(=O)-O-alkyl groups; or R<sup>8</sup> may be absent if D is  
250 nitrogen;

251 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
252 unsubstituted straight and branched chain alkyl groups having  
253 from 1 to 8 carbon atoms, substituted and unsubstituted  
254 cycloalkyl groups, substituted and unsubstituted aryl groups,  
255 substituted and unsubstituted aralkyl groups, substituted and  
256 unsubstituted heterocyclyl groups, substituted and unsubstituted  
257 heterocyclylalkyl groups, substituted and unsubstituted  
258 heterocyclylaminoalkyl groups, substituted and unsubstituted  
259 alkoxy groups, and -NH<sub>2</sub>, or R<sup>9</sup> and R<sup>10</sup> join together to form a  
260 ring having 5, 6, or 7 ring members; and

261 R<sup>10</sup> is -H, or R<sup>9</sup> and R<sup>10</sup> join together to form a ring having 5, 6,  
262 or 7 ring members.

1

4. The method of claim 3, wherein

2  $R^1$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 and straight and branched chain alkyl groups having from 1 to 8  
4 carbon atoms;

5  $R^2$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
6 -CN, -CO<sub>2</sub>H, -NO<sub>2</sub>, straight and branched chain alkyl groups  
7 having from 1 to 8 carbon atoms, substituted and unsubstituted  
8 cycloalkyl groups, substituted and unsubstituted cycloalkenyl  
9 groups, substituted and unsubstituted aryl groups, substituted  
10 and unsubstituted heterocyclyl groups, -OH, substituted and  
11 unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and  
12 unsubstituted -N(H)(alkyl) groups, and substituted and  
13 unsubstituted -N(alkyl)<sub>2</sub> groups;

14  $R^3$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
15 -CN, straight and branched chain alkyl groups having from 1 to 8  
16 carbon atoms, substituted and unsubstituted aryl groups,  
17 substituted and unsubstituted heterocyclyl groups, -OH,  
18 substituted and unsubstituted alkoxy groups, substituted and  
19 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
20 -N(H)(cycloalkyl) groups, substituted and unsubstituted  
21 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
22 -N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
23 -N(alkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and unsubstituted  
24 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
25 -C(=O)-alkyl groups, substituted and unsubstituted -C(=O)-  
26 N(H)(alkyl) groups, substituted and unsubstituted  
27 -C(=O)-N(alkyl)<sub>2</sub> groups, -C(=O)-NH<sub>2</sub> groups, substituted and  
28 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, and substituted  
29 and unsubstituted -C(=O)-N(H)(aryl) groups;

30  $R^4$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
31 and straight and branched chain alkyl groups having from 1 to 8  
32 carbon atoms;

33  $R^5$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
34 straight and branched chain alkyl groups having from 1 to 8  
35 carbon atoms, and substituted and unsubstituted heterocyclyl  
36 groups; or  $R^5$  may be absent if A is nitrogen;

37  $R^6$  is selected from the group consisting of -H, -F, -Cl, -Br,  
38 substituted and unsubstituted alkyl groups having from 1 to 8  
39 carbon atoms, substituted and unsubstituted heterocyclyl  
40 groups, -OH, substituted and unsubstituted alkoxy groups,  
41 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
42 and unsubstituted -N(H)(heterocyclyl) groups, and substituted  
43 and unsubstituted -N(alkyl)(heterocyclyl) groups; or  $R^6$  may be  
44 absent if B is nitrogen;

45  $R^7$  is selected from the group consisting of -H, -Cl, -F, -Br,  
46 substituted and unsubstituted alkyl groups having from 1 to 8  
47 carbon atoms, -OH, substituted and unsubstituted alkoxy  
48 groups, substituted and unsubstituted heterocyclyl groups,  
49 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
50 and unsubstituted -N(H)(heterocyclyl) groups, and substituted  
51 and unsubstituted -N(alkyl)(heterocyclyl) groups; or  $R^7$  may be  
52 absent if C is nitrogen; and

53  $R^8$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
54 straight and branched chain alkyl groups having from 1 to 8  
55 carbon atoms, and substituted and unsubstituted heterocyclyl  
56 groups; or  $R^8$  may be absent if D is nitrogen.

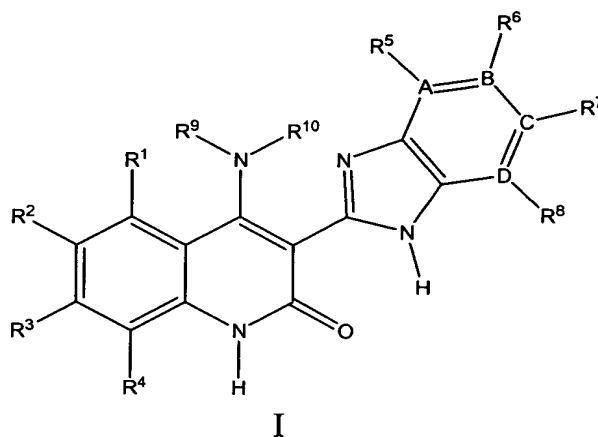
1                    5.        The method of claim 3, wherein R<sup>9</sup> is selected from the  
2 group consisting of substituted and unsubstituted straight and branched chain  
3 alkyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted  
4 cycloalkyl groups, substituted and unsubstituted aryl groups, substituted and  
5 unsubstituted aralkyl groups, substituted and unsubstituted heterocyclyl  
6 groups, substituted and unsubstituted heterocyclylalkyl groups, substituted  
7 and unsubstituted heterocyclylaminoalkyl groups, substituted and  
8 unsubstituted alkoxy groups, and -NH<sub>2</sub>.

1                    6.        The method of claim 3, wherein R<sup>2</sup> is selected from the  
2 group consisting of -H, -Cl, -F, -Br, -I, -CH<sub>3</sub>, -NO<sub>2</sub>, -OMe, -CN, -CO<sub>2</sub>H,  
3 substituted and unsubstituted 1,2,3,6-tetrahydropyridine groups, substituted  
4 and unsubstituted thiophene groups, substituted and unsubstituted imidazole  
5 groups, substituted and unsubstituted pyrrole groups, substituted and  
6 unsubstituted 3-pyridinyl groups, substituted and unsubstituted 4-pyridinyl  
7 groups, phenyl, 2-substituted phenyl groups, 2,4-disubstituted phenyl groups,  
8 4-substituted phenyl groups, 3-substituted phenyl groups, 2,6-disubstituted  
9 phenyl groups, 3,4-disubstituted phenyl groups, substituted and unsubstituted  
10 dialkylamino groups, and substituted and unsubstituted alkylamino groups.

1                    7.        The method of claim 3, wherein R<sup>3</sup> is selected from the  
2 group consisting of -H, -F, -Cl, -Br, -CH<sub>3</sub>, -OH, -CN, substituted and  
3 unsubstituted aryl groups, substituted and unsubstituted heterocyclyl groups,  
4 substituted and unsubstituted alkoxy groups, substituted and unsubstituted  
5 alkylamino groups, substituted and unsubstituted dialkylamino groups,  
6 substituted and unsubstituted -C(=O)-heterocyclyl groups, substituted and  
7 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, and -C(=O)-NH<sub>2</sub> groups.

1                    8.        A method of inhibiting a serine/threonine kinase in a  
2 subject or treating a biological condition mediated by a serine/threonine  
3 kinase in a subject, comprising: administering to the subject a compound of

4 Structure I, a tautomer of the compound, a pharmaceutically acceptable salt  
5 of the compound, a pharmaceutically acceptable salt of the tautomer, or  
6 mixtures thereof wherein Structure I has the following formula and the  
7 serine/threonine kinase is cyclin dependent kinase 2



8

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wherein,

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A, B, C, and D are independently selected from the group  
11 consisting of carbon and nitrogen;

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$R^1$ ,  $R^4$ ,  $R^5$ , and  $R^8$  are independently selected from the group  
13 consisting of -H and substituted and unsubstituted straight and  
14 branched chain alkyl groups having from 1 to 8 carbon atoms; or  
15  $R^5$  may be absent if A is nitrogen; or  $R^8$  may be absent if D is  
16 nitrogen;

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$R^2$  and  $R^3$  are independently selected from the group consisting  
18 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
19 alkyl groups having from 1 to 12 carbon atoms, substituted and  
20 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
21 substituted and unsubstituted aryl groups, substituted and  
22 unsubstituted aralkyl groups, substituted and unsubstituted  
23 heterocyclyl groups, substituted and unsubstituted

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24 heterocyclalkyl groups, -NH<sub>2</sub>, substituted and unsubstituted  
25 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
26 groups, substituted and unsubstituted -N(H)(aryl) groups,  
27 substituted and unsubstituted -N(alkyl)(aryl) groups, substituted  
28 and unsubstituted -N(aryl)<sub>2</sub> groups, substituted and  
29 unsubstituted -N(H)(heterocycl) groups, substituted and  
30 unsubstituted -N(alkyl)(heterocycl) groups, substituted and  
31 unsubstituted -N(heterocycl)<sub>2</sub> groups;

32 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
33 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
34 alkyl groups having from 1 to 12 carbon atoms, substituted and  
35 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
36 substituted and unsubstituted heterocycl groups, substituted  
37 and unsubstituted heterocyclalkyl groups, -OH, substituted and  
38 unsubstituted alkoxy groups, substituted and unsubstituted  
39 heterocycloxy groups, substituted and unsubstituted  
40 heterocyclalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
41 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
42 groups, substituted and unsubstituted -N(H)(heterocycl)  
43 groups, substituted and unsubstituted -N(alkyl)(heterocycl)  
44 groups, substituted and unsubstituted -N(heterocycl)<sub>2</sub> groups,  
45 substituted and unsubstituted -N(H)(heterocyclalkyl) groups,  
46 substituted and unsubstituted -N(alkyl)(heterocyclalkyl) groups,  
47 substituted and unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups,  
48 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
49 substituted and unsubstituted -N(H)-C(=O)-heterocycl groups,  
50 and substituted and unsubstituted -N(H)-C(=O)-heterocyclalkyl  
51 groups; or R<sup>6</sup> may be absent if B is nitrogen; or R<sup>7</sup> may be  
52 absent if C is nitrogen;



53                     $R^9$  is selected from the group consisting of -H, substituted and  
54                    unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
55                    substituted and unsubstituted alkenyl groups having from 1 to 12  
56                    carbon atoms, substituted and unsubstituted heterocyclyl  
57                    groups, substituted and unsubstituted heterocyclalkyl groups,  
58                    -OH, substituted and unsubstituted alkoxy groups, substituted  
59                    and unsubstituted heterocycloxy groups, substituted and  
60                    unsubstituted heterocyclalkoxy groups, substituted and  
61                    unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
62                    -C(=O)-heterocyclyl groups, and substituted and unsubstituted  
63                    -C(=O)-heterocyclalkyl groups;

64                     $R^{10}$  is -H.

1                    9.        The method of claim 8, wherein  $R^9$  is selected from the  
2                    group consisting of -H, substituted and unsubstituted straight or branched  
3                    chain alkyl groups having from 1-8 carbon atoms, substituted and  
4                    unsubstituted saturated heterocyclyl groups, substituted and unsubstituted  
5                    heterocyclalkyl groups wherein the heterocyclyl moiety is saturated,  
6                    substituted and unsubstituted alkoxy groups, and substituted and  
7                    unsubstituted heterocyclalkoxy groups wherein the heterocyclyl moiety is  
8                    saturated.

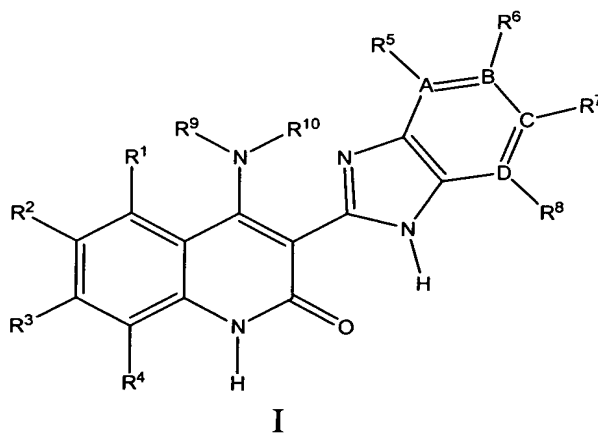
1                    10.       The method of claim 8, wherein  $R^2$  is selected from the  
2                    group consisting of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, -NH<sub>2</sub>, substituted and  
3                    unsubstituted straight or branched chain alkyl groups having from 1 to 8  
4                    carbons, substituted and unsubstituted aryl groups, and substituted and  
5                    unsubstituted pyridinyl groups.

1                    11.       The method of claim 8, wherein  $R^3$  is selected from the  
2                    group consisting of -H, -F, -Cl, -Br, -I, substituted and unsubstituted straight or

3 branched chain alkyl groups having from 1 to 8 carbon atoms, substituted and  
4 unsubstituted aryl groups, substituted and unsubstituted aralkyl groups.

1 12. The method of claim 8, wherein R<sup>6</sup> and R<sup>7</sup> are  
2 independently selected from the group consisting of -H, -F, -Cl, -Br, -I, -OH,  
3 substituted and unsubstituted -N(alkyl)(piperidinyl), substituted and  
4 unsubstituted piperidinyl groups, substituted and unsubstituted morpholinyl  
5 groups, substituted and unsubstituted piperazinyl groups; or R<sup>6</sup> may be  
6 absent if B is nitrogen; or R<sup>7</sup> may be absent if C is nitrogen.

1 13. A method of inhibiting a serine/threonine kinase in a  
2 subject or treating a biological condition mediated by a serine/threonine  
3 kinase in a subject, comprising: administering to the subject a compound of  
4 Structure I, a tautomer of the compound, a pharmaceutically acceptable salt  
5 of the compound, a pharmaceutically acceptable salt of the tautomer, or  
6 mixtures thereof wherein Structure I has the following formula and the  
7 serine/threonine kinase is checkpoint kinase 1



8

9

wherein,

10

11

A, B, C, and D are independently selected from the group  
consisting of carbon and nitrogen;

12  $R^1$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
13 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
14 from 1 to 12 carbon atoms, substituted and unsubstituted  
15 alkenyl groups having from 1 to 12 carbon atoms, substituted  
16 and unsubstituted alkynyl groups having from 1 to 8 carbon  
17 atoms, substituted and unsubstituted heterocyclyl groups, -OH,  
18 substituted and unsubstituted alkoxy groups, substituted and  
19 unsubstituted aryloxy groups, substituted and unsubstituted  
20 arylalkoxy groups, substituted and unsubstituted heterocyclyloxy  
21 groups, substituted and unsubstituted heterocyclylalkoxy  
22 groups, -SH, substituted and unsubstituted -S-alkyl groups, -NH<sub>2</sub>,  
23 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
24 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
25 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
26 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
27 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
28 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
29 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, and substituted  
30 and unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups;

31  $R^2$  and  $R^3$  are independently selected from the group consisting  
32 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
33 alkyl groups having from 1 to 12 carbon atoms, substituted and  
34 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
35 substituted and unsubstituted alkynyl groups having from 1 to 8  
36 carbon atoms, substituted and unsubstituted aryl groups,  
37 substituted and unsubstituted aralkyl groups, substituted and  
38 unsubstituted heterocyclyl groups, substituted and unsubstituted  
39 heterocyclylalkyl groups, -SH, substituted and unsubstituted -S-  
40 alkyl groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl  
41 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups,  
42 substituted and unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups,

43 substituted and unsubstituted -S(=O)-alkyl groups, substituted  
44 and unsubstituted -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>,  
45 substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups,  
46 substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups,  
47 substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(aryl) groups,  
48 substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)(aryl) groups,  
49 substituted and unsubstituted -S(=O)<sub>2</sub>-N(aryl)<sub>2</sub> groups,  
50 substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(aralkyl) groups,  
51 substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)(aralkyl) groups,  
52 substituted and unsubstituted -S(=O)<sub>2</sub>-N(aralkyl)<sub>2</sub> groups, -OH,  
53 substituted and unsubstituted alkoxy groups, substituted and  
54 unsubstituted aryloxy groups, substituted and unsubstituted  
55 arylalkoxy groups, substituted and unsubstituted heterocyclyloxy  
56 groups, substituted and unsubstituted heterocyclylalkoxy  
57 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
58 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
59 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
60 -N(alkyl)(aryl) groups, substituted and unsubstituted -N(aryl)<sub>2</sub>  
61 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
62 substituted and unsubstituted -N(alkyl)(aralkyl) groups,  
63 substituted and unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted  
64 and unsubstituted -N(H)(heterocyclyl) groups, substituted and  
65 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
66 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
67 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
68 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
69 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
70 unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
71 unsubstituted -N(H)-S(=O)<sub>2</sub>-aryl groups, substituted and  
72 unsubstituted -N(H)-S(=O)<sub>2</sub>-aralkyl groups, substituted and  
73 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
74 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclylalkyl groups, substituted

75 and unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
76 unsubstituted -N(H)-C(=O)-aryl groups, substituted and  
77 unsubstituted -N(H)-C(=O)-aralkyl groups, substituted and  
78 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
79 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
80 and unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
81 unsubstituted -N(alkyl)-C(=O)-aryl groups, substituted and  
82 unsubstituted -N(alkyl)-C(=O)-aralkyl groups, substituted and  
83 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
84 and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl groups,  
85 substituted and unsubstituted -N(alkyl)-S(=O)-alkyl groups,  
86 substituted and unsubstituted -N(alkyl)-S(=O)-aryl groups,  
87 substituted and unsubstituted -N(alkyl)-S(=O)-aralkyl groups,  
88 substituted and unsubstituted -N(alkyl)-S(=O)-heterocyclyl  
89 groups, substituted and unsubstituted  
90 -N(alkyl)-S(=O)-heterocyclylalkyl groups, -N(H)-C(=O)-NH<sub>2</sub>,  
91 substituted and unsubstituted -N(H)-C(=O)-N(H)(alkyl) groups,  
92 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)<sub>2</sub> groups,  
93 substituted and unsubstituted -N(H)-C(=O)-N(H)(aryl) groups,  
94 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)(aryl) groups,  
95 substituted and unsubstituted -N(H)-C(=O)-N(aryl)<sub>2</sub> groups,  
96 substituted and unsubstituted -N(H)-C(=O)-N(H)(aralkyl) groups,  
97 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)(aralkyl)  
98 groups, substituted and unsubstituted -N(H)-C(=O)-N(aralkyl)<sub>2</sub>  
99 groups, substituted and unsubstituted  
100 -N(H)-C(=O)-N(H)(heterocyclyl) groups, substituted and  
101 unsubstituted -N(H)-C(=O)-N(alkyl)(heterocyclyl) groups,  
102 substituted and unsubstituted -N(H)-C(=O)-N(heterocyclyl)<sub>2</sub>  
103 groups, substituted and unsubstituted  
104 -N(H)-C(=O)-N(H)(heterocyclylalkyl) groups, substituted and  
105 unsubstituted -N(H)-C(=O)-N(alkyl)(heterocyclylalkyl) groups,  
106 substituted and unsubstituted -N(H)-C(=O)-N(heterocyclylalkyl)<sub>2</sub>

107	groups, substituted and unsubstituted -N(alkyl)-C(=O)-NH <sub>2</sub>
108	groups, substituted and unsubstituted
109	-N(alkyl)-C(=O)-N(H)(alkyl) groups substituted and unsubstituted
110	-N(alkyl)-C(=O)-N(alkyl) <sub>2</sub> groups, substituted and unsubstituted
111	-N(alkyl)-C(=O)-N(H)(aryl) groups, substituted and unsubstituted
112	-N(alkyl)-C(=O)-N(alkyl)(aryl) groups, substituted and
113	unsubstituted -N(alkyl)-C(=O)-N(aryl) <sub>2</sub> groups, substituted and
114	unsubstituted -N(alkyl)-C(=O)-N(H)(aralkyl) groups, substituted
115	and unsubstituted -N(alkyl)-C(=O)-N(alkyl)(aralkyl) groups,
116	substituted and unsubstituted -N(alkyl)-C(=O)-N(aralkyl) <sub>2</sub>
117	groups, substituted and unsubstituted
118	-N(alkyl)-C(=O)-N(H)(heterocyclyl) groups, substituted and
119	unsubstituted -N(alkyl)-C(=O)-N(alkyl)(heterocyclyl) groups,
120	substituted and unsubstituted -N(alkyl)-C(=O)-N(heterocyclyl) <sub>2</sub>
121	groups, substituted and unsubstituted
122	-N(alkyl)-C(=O)-N(H)(heterocyclylalkyl) groups, substituted and
123	unsubstituted -N(alkyl)-C(=O)-N(alkyl)(heterocyclylalkyl) groups,
124	substituted and unsubstituted
125	-N(alkyl)-C(=O)-N(heterocyclylalkyl) <sub>2</sub> groups, substituted and
126	unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted
127	-C(=O)-aryl groups, substituted and unsubstituted -C(=O)-aralkyl
128	groups, substituted and unsubstituted -C(=O)-heterocyclyl
129	groups, substituted and unsubstituted -C(=O)-heterocyclylalkyl
130	groups, -C(=O)-NH <sub>2</sub> , substituted and unsubstituted
131	-C(=O)-N(H)(alkyl) groups, substituted and unsubstituted
132	-C(=O)-N(alkyl) <sub>2</sub> groups, substituted and unsubstituted
133	-C(=O)-N(H)(aryl) groups, substituted and unsubstituted
134	-C(=O)-N(alkyl)(aryl) groups, substituted and unsubstituted
135	-C(=O)-N(aryl) <sub>2</sub> groups, substituted and unsubstituted
136	-C(=O)-N(H)(aralkyl) groups, substituted and unsubstituted
137	-C(=O)-N(alkyl)(aralkyl) groups, substituted and unsubstituted
138	-C(=O)-N(aralkyl) <sub>2</sub> groups, substituted and unsubstituted

139 -C(=O)-N(H)(heterocyclyl) groups, substituted and unsubstituted  
140 -C(=O)-N(alkyl)(heterocyclyl) groups, substituted and  
141 unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted and  
142 unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups, substituted  
143 and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl) groups,  
144 substituted and unsubstituted -C(=O)-N(heterocyclylalkyl)<sub>2</sub>  
145 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
146 groups, substituted and unsubstituted -C(=O)-O-aryl groups,  
147 substituted and unsubstituted -C(=O)-O-heterocyclyl groups,  
148 and substituted and unsubstituted -C(=O)-O-heterocyclylalkyl  
149 groups;

150 R<sup>4</sup> is selected from the group consisting of -H and substituted  
151 and unsubstituted alkyl groups having from 1 to 12 carbon  
152 atoms;

153 R<sup>5</sup> and R<sup>8</sup> are independently selected from the group consisting  
154 of -H, substituted and unsubstituted alkyl groups having from 1  
155 to 12 carbon atoms, substituted and unsubstituted alkenyl  
156 groups having from 1 to 12 carbon atoms, substituted and  
157 unsubstituted heterocyclyl groups; or R<sup>5</sup> may be absent if A is  
158 nitrogen; or R<sup>8</sup> may be absent if D is nitrogen;

159 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
160 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
161 alkyl groups having from 1 to 12 carbon atoms, substituted and  
162 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
163 substituted and unsubstituted alkynyl groups having from 1 to 8  
164 carbon atoms, substituted and unsubstituted heterocyclyl  
165 groups, substituted and unsubstituted heterocyclylalkyl groups,  
166 -SH, substituted and unsubstituted -S-alkyl groups, substituted

167 and unsubstituted  $-S(=O)_2-O$ -alkyl groups, substituted and  
168 unsubstituted  $-S(=O)_2$ -alkyl groups, substituted and  
169 unsubstituted  $-S(=O)_2$ -heterocyclyl groups, substituted and  
170 unsubstituted  $-S(=O)$ -alkyl groups, substituted and unsubstituted  
171  $-S(=O)$ -heterocyclyl groups,  $-S(=O)_2-NH_2$ , substituted and  
172 unsubstituted  $-S(=O)_2-N(H)(alkyl)$  groups, substituted and  
173 unsubstituted  $-S(=O)_2-N(alkyl)_2$  groups, substituted and  
174 unsubstituted  $-S(=O)_2-N(H)(heterocyclyl)$  groups, substituted  
175 and unsubstituted  $-S(=O)_2-N(alkyl)(heterocyclyl)$  groups,  
176 substituted and unsubstituted  $-S(=O)_2-N(heterocyclyl)_2$  groups,  
177 substituted and unsubstituted  $-S(=O)_2-N(H)(heterocyclylalkyl)$   
178 groups, substituted and unsubstituted  
179  $-S(=O)_2-N(alkyl)(heterocyclylalkyl)$  groups, substituted and  
180 unsubstituted  $-S(=O)_2-N(heterocyclylalkyl)_2$  groups,  $-OH$ ,  
181 substituted and unsubstituted alkoxy groups, substituted and  
182 unsubstituted aryloxy groups, substituted and unsubstituted  
183 arylalkoxy groups, substituted and unsubstituted heterocyclyloxy  
184 groups, substituted and unsubstituted heterocyclylalkoxy  
185 groups,  $-NH_2$ , substituted and unsubstituted  $-N(H)(alkyl)$  groups,  
186 substituted and unsubstituted  $-N(alkyl)_2$  groups, substituted and  
187 unsubstituted  $-N(H)(aryl)$  groups, substituted and unsubstituted  
188  $-N(alkyl)(aryl)$  groups, substituted and unsubstituted  $-N(aryl)_2$   
189 groups, substituted and unsubstituted  $-N(H)(aralkyl)$  groups,  
190 substituted and unsubstituted  $-N(alkyl)(aralkyl)$  groups,  
191 substituted and unsubstituted  $-N(aralkyl)_2$  groups, substituted  
192 and unsubstituted  $-N(H)(heterocyclyl)$  groups, substituted and  
193 unsubstituted  $-N(alkyl)(heterocyclyl)$  groups, substituted and  
194 unsubstituted  $-N(heterocyclyl)_2$  groups, substituted and  
195 unsubstituted  $-N(H)(heterocyclylalkyl)$  groups, substituted and  
196 unsubstituted  $-N(alkyl)(heterocyclylalkyl)$  groups, substituted and  
197 unsubstituted  $-N(heterocyclylalkyl)_2$  groups, substituted and  
198 unsubstituted  $-N(H)-S(=O)_2$ -alkyl groups, substituted and



199 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
200 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclylalkyl groups, substituted  
201 and unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
202 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
203 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
204 and unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
205 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
206 and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl groups,  
207 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-alkyl groups,  
208 substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocyclyl  
209 groups, substituted and unsubstituted  
210 -N(alkyl)-S(=O)<sub>2</sub>-heterocyclylalkyl groups, substituted and  
211 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
212 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
213 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
214 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
215 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
216 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
217 unsubstituted -C(=O)-N(alkyl)(aryl) groups, substituted and  
218 unsubstituted -C(=O)-N(aryl)<sub>2</sub> groups, substituted and  
219 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
220 unsubstituted -C(=O)-N(alkyl)(aralkyl) groups, substituted and  
221 unsubstituted -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
222 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
223 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
224 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
225 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,  
226 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl)  
227 groups, substituted and unsubstituted  
228 -C(=O)-N(heterocyclylalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
229 unsubstituted -C(=O)-O-alkyl groups, substituted and  
230 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted

231 and unsubstituted -C(=O)-O-heterocyclalkyl groups; or R<sup>6</sup> may  
232 be absent if B is nitrogen; or R<sup>7</sup> may be absent if C is nitrogen;

233 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
234 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
235 substituted and unsubstituted aryl groups, substituted and  
236 unsubstituted aralkyl groups, substituted and unsubstituted  
237 heterocycl groups, substituted and unsubstituted  
238 heterocyclalkyl groups, substituted and unsubstituted  
239 heterocyclaminoalkyl groups, substituted and unsubstituted  
240 alkoxy groups, and -NH<sub>2</sub>, or R<sup>9</sup> and R<sup>10</sup> join together to form one  
241 or more rings, each having 5, 6, or 7 ring members; and

242 R<sup>10</sup> is -H, or R<sup>9</sup> and R<sup>10</sup> join together to form one or more rings,  
243 each having 5, 6, or 7 ring members.

1 14. The method of claim 13, wherein

2 R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 -CN, -NO<sub>2</sub>, substituted and unsubstituted straight and branched  
4 chain alkyl groups having from 1 to 8 carbon atoms, substituted  
5 and unsubstituted cycloalkyl groups, substituted and  
6 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
7 substituted and unsubstituted heterocycl groups, -OH,  
8 substituted and unsubstituted alkoxy groups, substituted and  
9 unsubstituted aryloxy groups, substituted and unsubstituted  
10 arylalkoxy groups, substituted and unsubstituted heterocyclloxy  
11 groups, substituted and unsubstituted heterocyclalkoxy  
12 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
13 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
14 unsubstituted -N(H)(heterocycl) groups, substituted and

- 15 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
16 unsubstituted -N(H)(heterocyclylalkyl) groups, and substituted  
17 and unsubstituted -N(alkyl)(heterocyclylalkyl) groups;
- 18  $R^2$  and  $R^3$  are independently selected from the group consisting  
19 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
20 alkyl groups having from 1 to 12 carbon atoms, substituted and  
21 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
22 substituted and unsubstituted alkynyl groups having from 1 to 8  
23 carbon atoms, substituted and unsubstituted aryl groups,  
24 substituted and unsubstituted aralkyl groups, substituted and  
25 unsubstituted heterocyclyl groups, substituted and unsubstituted  
26 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
27 alkoxy groups, substituted and unsubstituted aryloxy groups,  
28 substituted and unsubstituted arylalkoxy groups, substituted and  
29 unsubstituted heterocyclyoxy groups, substituted and  
30 unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and  
31 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
32 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted -N(H)(aryl)  
33 groups, substituted and unsubstituted -N(alkyl)(aryl) groups,  
34 substituted and unsubstituted -N(aryl)<sub>2</sub> groups, substituted and  
35 unsubstituted -N(H)(aralkyl) groups, substituted and  
36 unsubstituted -N(alkyl)(aralkyl) groups, substituted and  
37 unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted and unsubstituted  
38 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
39 -N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
40 -N(heterocyclyl)<sub>2</sub> groups, substituted and unsubstituted  
41 -N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
42 -N(alkyl)(heterocyclylalkyl) groups, substituted and unsubstituted  
43 -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and unsubstituted  
44 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
45 -N(H)-C(=O)-aryl groups, substituted and unsubstituted

46	-N(H)-C(=O)-aralkyl groups, substituted and unsubstituted
47	-N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted
48	-N(H)-C(=O)-heterocyclylalkyl groups, substituted and
49	unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and
50	unsubstituted -N(alkyl)-C(=O)-aryl groups, substituted and
51	unsubstituted -N(alkyl)-C(=O)-aralkyl groups, substituted and
52	unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted
53	and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl groups,
54	-N(H)-C(=O)-NH <sub>2</sub> , substituted and unsubstituted
55	-N(H)-C(=O)-N(H)(alkyl) groups, substituted and unsubstituted
56	-N(H)-C(=O)-N(alkyl) <sub>2</sub> groups, substituted and unsubstituted
57	-N(H)-C(=O)-N(H)(aryl) groups, substituted and unsubstituted
58	-N(H)-C(=O)-N(alkyl)(aryl) groups, substituted and unsubstituted
59	-N(H)-C(=O)-N(aryl) <sub>2</sub> groups, substituted and unsubstituted
60	-N(H)-C(=O)-N(H)(aralkyl) groups, substituted and unsubstituted
61	-N(H)-C(=O)-N(alkyl)(aralkyl) groups, substituted and
62	unsubstituted -N(H)-C(=O)-N(aralkyl) <sub>2</sub> groups, substituted and
63	unsubstituted -N(H)-C(=O)-N(H)(heterocyclyl) groups,
64	substituted and unsubstituted -N(H)-C(=O)-N(alkyl)(heterocyclyl)
65	groups, substituted and unsubstituted
66	-N(H)-C(=O)-N(heterocyclyl) <sub>2</sub> groups, substituted and
67	unsubstituted -N(H)-C(=O)-N(H)(heterocyclylalkyl) groups,
68	substituted and unsubstituted
69	-N(H)-C(=O)-N(alkyl)(heterocyclylalkyl) groups, substituted and
70	unsubstituted -N(H)-C(=O)-N(heterocyclylalkyl) <sub>2</sub> groups,
71	substituted and unsubstituted -N(alkyl)-C(=O)-NH <sub>2</sub> groups,
72	substituted and unsubstituted -N(alkyl)-C(=O)-N(H)(alkyl)
73	groups, substituted and unsubstituted -N(alkyl)-C(=O)-N(H)(aryl)
74	groups, substituted and unsubstituted
75	-N(alkyl)-C(=O)-N(H)(aralkyl) groups, substituted and
76	unsubstituted -N(alkyl)-C(=O)-N(H)(heterocyclyl) groups,
77	substituted and unsubstituted

78 -N(alkyl)-C(=O)-N(H)(heterocyclalkyl) groups, substituted and  
79 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
80 -C(=O)-aryl groups, substituted and unsubstituted -C(=O)-aralkyl  
81 groups, substituted and unsubstituted -C(=O)-heterocycl  
82 groups, substituted and unsubstituted -C(=O)-heterocyclalkyl  
83 groups, -C(=O)-NH<sub>2</sub>, substituted and unsubstituted  
84 -C(=O)-N(H)(alkyl) groups, substituted and unsubstituted  
85 -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
86 -C(=O)-N(H)(aryl) groups, substituted and unsubstituted  
87 -C(=O)-N(alkyl)(aryl) groups, substituted and unsubstituted  
88 -C(=O)-N(aryl)<sub>2</sub> groups, substituted and unsubstituted  
89 -C(=O)-N(H)(aralkyl) groups, substituted and unsubstituted  
90 -C(=O)-N(alkyl)(aralkyl) groups, substituted and unsubstituted  
91 -C(=O)-N(aralkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and unsubstituted  
92 -C(=O)-O-alkyl groups, substituted and unsubstituted  
93 -C(=O)-O-aryl groups, substituted and unsubstituted  
94 -C(=O)-O-heterocycl groups, and substituted and  
95 unsubstituted -C(=O)-O-heterocyclalkyl groups;

96 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
97 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
98 alkyl groups having from 1 to 12 carbon atoms, substituted and  
99 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
100 substituted and unsubstituted alkynyl groups having from 1 to 8  
101 carbon atoms, substituted and unsubstituted heterocycl  
102 groups, substituted and unsubstituted heterocyclalkyl groups,  
103 -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl)  
104 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups,  
105 -OH, substituted and unsubstituted alkoxy groups, substituted  
106 and unsubstituted aryloxy groups, substituted and unsubstituted  
107 arylalkoxy groups, substituted and unsubstituted heterocycloxy  
108 groups, substituted and unsubstituted heterocyclalkoxy

109 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
110 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
111 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
112 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
113 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
114 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
115 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
116 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
117 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
118 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
119 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
120 and unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
121 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
122 and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl groups,  
123 substituted and unsubstituted -C(=O)-alkyl groups, substituted  
124 and unsubstituted -C(=O)-heterocyclyl groups, substituted and  
125 unsubstituted -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>,  
126 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
127 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
128 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
129 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclyl)  
130 groups, substituted and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub>  
131 groups, substituted and unsubstituted  
132 -C(=O)-N(H)(heterocyclylalkyl) groups, substituted and  
133 unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl) groups,  
134 substituted and unsubstituted -C(=O)-N(heterocyclylalkyl)<sub>2</sub>  
135 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
136 groups, substituted and unsubstituted -C(=O)-O-heterocyclyl  
137 groups, and substituted and unsubstituted  
138 -C(=O)-O-heterocyclylalkyl groups; or R<sup>6</sup> may be absent if B is  
139 nitrogen; or R<sup>7</sup> may be absent if C is nitrogen.

1                    15.    The method of claim 13, wherein R<sup>9</sup> is selected from the  
2 group consisting of substituted and unsubstituted straight and branched chain  
3 alkyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted  
4 cycloalkyl groups, substituted and unsubstituted aryl groups, substituted and  
5 unsubstituted aralkyl groups, substituted and unsubstituted heterocyclyl  
6 groups, substituted and unsubstituted heterocyclylalkyl groups, and  
7 substituted and unsubstituted heterocyclylaminoalkyl groups.

1                    16.    The method of claim 13, wherein R<sup>9</sup> is selected from the  
2 group consisting of substituted and unsubstituted cyclohexyl groups,  
3 substituted and unsubstituted cyclohexylalkyl groups, substituted and  
4 unsubstituted pyrrolidinyl groups, substituted and unsubstituted  
5 pyrrolidinylalkyl groups, substituted and unsubstituted tetrahydrofuranylalkyl  
6 groups, substituted and unsubstituted piperidinyl groups, substituted and  
7 unsubstituted piperidinylalkyl groups, substituted and unsubstituted  
8 piperazinylalkyl groups, substituted and unsubstituted morpholinylalkyl  
9 groups, and substituted and unsubstituted quinuclidinyl groups.

1                    17.    The method of claim 13, wherein R<sup>1</sup> is selected from the  
2 group consisting of -H, -F, -Cl, -Br, -I, substituted and unsubstituted straight  
3 and branched chain alkyl groups having from 1 to 4 carbon atoms, substituted  
4 and unsubstituted heterocyclyl groups, -OH, substituted and unsubstituted  
5 alkoxy groups, substituted and unsubstituted aryloxy groups, substituted and  
6 unsubstituted heterocyclloxy groups, substituted and unsubstituted  
7 heterocyclylalkoxy groups, and substituted and unsubstituted -N(H)(alkyl)  
8 groups.

1                    18.    The method of claim 13, wherein R<sup>3</sup> is selected from the  
2 group consisting of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and  
3 unsubstituted straight or branched chain alkyl groups having from 1 to 8  
4 carbon atoms, -OH, substituted and unsubstituted alkoxy groups, substituted

5 and unsubstituted heterocyclyloxy groups, and substituted and unsubstituted  
6 heterocyclylalkoxy groups.

1                    19. The method of claim 13, wherein R<sup>6</sup> and R<sup>7</sup> are  
2 independently selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 substituted and unsubstituted alkyl groups having from 1 to 8 carbon atoms,  
4 substituted and unsubstituted heterocyclyl groups, substituted and  
5 unsubstituted heterocyclylalkyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
6 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and unsubstituted  
7 -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and unsubstituted alkoxy groups,  
8 substituted and unsubstituted aryloxy groups, substituted and unsubstituted  
9 arylalkoxy groups, substituted and unsubstituted heterocyclyloxy groups,  
10 substituted and unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted  
11 and unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
12 groups, substituted and unsubstituted -N(H)(heterocyclyl) groups, substituted  
13 and unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
14 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
15 -N(alkyl)(heterocyclylalkyl) groups, substituted and unsubstituted -C(=O)-alkyl  
16 groups, substituted and unsubstituted -C(=O)-heterocyclyl groups, substituted  
17 and unsubstituted -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted  
18 and unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and unsubstituted  
19 -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
20 -C(=O)-N(H)(heterocyclyl) groups, substituted and unsubstituted  
21 -C(=O)-N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
22 -C(=O)-N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
23 -C(=O)-N(alkyl)(heterocyclylalkyl) groups, -CO<sub>2</sub>H, substituted and  
24 unsubstituted -C(=O)-O-alkyl groups, substituted and unsubstituted  
25 -C(=O)-O-heterocyclyl groups, and substituted and unsubstituted  
26 -C(=O)-O-heterocyclylalkyl groups; or R<sup>6</sup> may be absent if B is nitrogen; or R<sup>7</sup>  
27 may be absent if C is nitrogen.



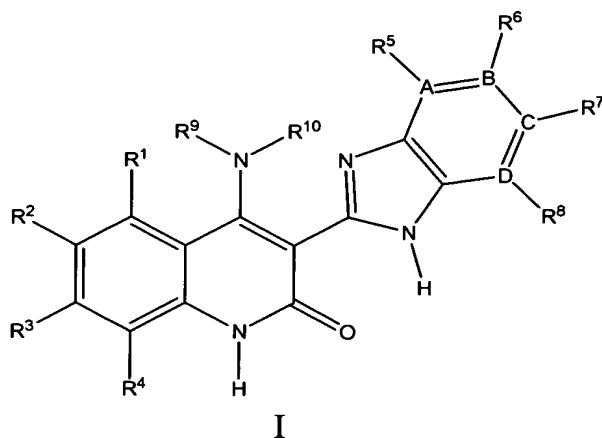
1                    20.    The method of claim 13, wherein R<sup>6</sup> and R<sup>7</sup> are  
2 independently selected from the group consisting of substituted and  
3 unsubstituted heterocyclyl groups and substituted and unsubstituted  
4 heterocyclylalkyl groups; or R<sup>6</sup> may be absent if B is nitrogen; or R<sup>7</sup> may be  
5 absent if C is nitrogen.

1                    21.    The method of claim 13, wherein R<sup>6</sup> and R<sup>7</sup> are  
2 independently selected from the group consisting of substituted and  
3 unsubstituted pyrrolidinyl groups, substituted and unsubstituted  
4 piperidinylalkyl groups, substituted and unsubstituted piperazinyl groups,  
5 substituted and unsubstituted morpholinyl groups, substituted and  
6 unsubstituted thiomorpholinyl groups, substituted and unsubstituted  
7 dizeapanyl groups, substituted and unsubstituted oxazepanyl groups, and  
8 pyridinylalkyl groups.

1                    22.    The method of claim 13, wherein the IC<sub>50</sub> value of the  
2 compound is less than or equal to 0.001  $\mu$ M.

1                    23.    The method of claim 13, wherein the biological condition  
2 is cancer.

1                    24.    A method of inhibiting a serine/threonine kinase in a  
2 subject or treating a biological condition mediated by a serine/threonine  
3 kinase in a subject, comprising: administering to the subject a compound of  
4 Structure I, a tautomer of the compound, a pharmaceutically acceptable salt  
5 of the compound, a pharmaceutically acceptable salt of the tautomer, or  
6 mixtures thereof wherein Structure I has the following formula and the  
7 serine/threonine kinase is ribosomal S6 kinase 2



8

9

wherein,

10

A, B, C, and D are independently selected from the group consisting of carbon and nitrogen;

11

12

$R^1$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,

13

-CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having

14

from 1 to 12 carbon atoms, substituted and unsubstituted

15

alkenyl groups having from 1 to 12 carbon atoms, substituted

16

and unsubstituted heterocyclyl groups, substituted and

17

unsubstituted heterocyclylalkyl groups, -OH, substituted and

18

unsubstituted alkoxy groups, substituted and unsubstituted

19

heterocycloxy groups, substituted and unsubstituted

20

heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted

21

-N(H)(alkyl) groups, substituted and unsubstituted

22

-N(H)(heterocyclyl) groups, substituted and unsubstituted

23

-N(H)(heterocyclylalkyl) groups, substituted and unsubstituted

24

-N(H)-C(=O)-alkyl groups, substituted and unsubstituted

25

-N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted

26

-N(H)-C(=O)-heterocyclylalkyl groups, substituted and

27

unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted

28

-C(=O)-heterocyclyl groups, substituted and unsubstituted

29

-C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and

30 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
31 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
32 unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
33 -C(=O)-N(H)(heterocyclalkyl) groups, -CO<sub>2</sub>H, substituted and  
34 unsubstituted -C(=O)-O-alkyl groups, substituted and  
35 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
36 and unsubstituted -C(=O)-O-heterocyclalkyl groups;

37 R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting  
38 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
39 alkyl groups having from 1 to 12 carbon atoms, substituted and  
40 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
41 substituted and unsubstituted aryl groups, substituted and  
42 unsubstituted aralkyl groups, substituted and unsubstituted  
43 heterocyclyl groups, substituted and unsubstituted  
44 heterocyclalkyl groups, -SH, substituted and unsubstituted -S-  
45 alkyl groups, substituted and unsubstituted -S-aryl groups,  
46 substituted and unsubstituted -S-aralkyl groups, -OH,  
47 substituted and unsubstituted alkoxy groups, substituted and  
48 unsubstituted heterocycloxy groups, substituted and  
49 unsubstituted heterocyclalkoxy groups, -NH<sub>2</sub>, substituted and  
50 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
51 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted -N(H)(aryl)  
52 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
53 substituted and unsubstituted -N(H)(heterocyclyl) groups,  
54 substituted and unsubstituted -N(H)(heterocyclalkyl) groups,  
55 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
56 substituted and unsubstituted -N(H)-C(=O)-aryl groups,  
57 substituted and unsubstituted -N(H)-C(=O)-aralkyl groups,  
58 substituted and unsubstituted -N(H)-C(=O)-heterocyclyl groups,  
59 substituted and unsubstituted -N(H)-C(=O)-heterocyclalkyl  
60 groups, substituted and unsubstituted -C(=O)-alkyl groups,

61 substituted and unsubstituted -C(=O)-aryl groups, substituted  
62 and unsubstituted -C(=O)-aralkyl groups, substituted and  
63 unsubstituted -C(=O)-heterocyclyl groups, substituted and  
64 unsubstituted -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>,  
65 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
66 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
67 substituted and unsubstituted -C(=O)-N(H)(aryl) groups,  
68 substituted and unsubstituted -C(=O)-N(H)(aralkyl) groups,  
69 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
70 -C(=O)-N(H)(heterocyclylalkyl) groups, -CO<sub>2</sub>H, substituted and  
71 unsubstituted -C(=O)-O-alkyl groups, substituted and  
72 unsubstituted -C(=O)-O-aryl groups, substituted and  
73 unsubstituted -C(=O)-O-aralkyl groups, substituted and  
74 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
75 and unsubstituted -C(=O)-O-heterocyclylalkyl groups; or R<sup>2</sup> and  
76 R<sup>3</sup> may join together to form a cyclic group,

77 R<sup>4</sup>, R<sup>5</sup>, and R<sup>8</sup> are independently selected from the group  
78 consisting of -H and substituted and unsubstituted straight and  
79 branched chain alkyl groups having from 1 to 8 carbon atoms; or  
80 R<sup>5</sup> may be absent if A is nitrogen; or R<sup>8</sup> may be absent if D is  
81 nitrogen.

82 R<sup>6</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
83 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
84 from 1 to 12 carbon atoms, substituted and unsubstituted  
85 alkenyl groups having from 1 to 12 carbon atoms, substituted  
86 and unsubstituted heterocyclyl groups, substituted and  
87 unsubstituted heterocyclylalkyl groups, -OH, substituted and  
88 unsubstituted alkoxy groups, substituted and unsubstituted  
89 heterocycloxy groups, substituted and unsubstituted

- 90 heterocyclalkoxy groups,  $-\text{CO}_2\text{H}$ ,  $-\text{C}(=\text{O})-\text{NH}_2$ , substituted and  
91 unsubstituted  $-\text{C}(=\text{O})-\text{N}(\text{H})(\text{alkyl})$  groups, substituted and  
92 unsubstituted  $-\text{C}(=\text{O})-\text{N}(\text{alkyl})_2$  groups, substituted and  
93 unsubstituted  $-\text{C}(=\text{O})-\text{N}(\text{H})(\text{heterocycl})$  groups,  
94  $-\text{C}(=\text{O})-\text{N}(\text{H})(\text{heterocyclalkyl})$  groups, substituted and  
95 unsubstituted  $-\text{C}(=\text{O})-\text{O}-\text{alkyl}$  groups, substituted and  
96 unsubstituted  $-\text{C}(=\text{O})-\text{O}-\text{heterocycl}$  groups, substituted and  
97 unsubstituted  $-\text{C}(=\text{O})-\text{O}-\text{heterocyclalkyl}$  groups, substituted  
98 and unsubstituted  $-\text{C}(=\text{O})-\text{alkyl}$  groups, substituted and  
99 unsubstituted  $-\text{C}(=\text{O})-\text{heterocycl}$  groups, substituted and  
100 unsubstituted  $-\text{C}(=\text{O})-\text{heterocyclalkyl}$  groups,  $-\text{NH}_2$ , substituted  
101 and unsubstituted  $-\text{N}(\text{H})(\text{alkyl})$  groups, substituted and  
102 unsubstituted  $-\text{N}(\text{H})(\text{heterocycl})$  groups, substituted and  
103 unsubstituted  $-\text{N}(\text{H})(\text{heterocyclalkyl})$  groups, substituted and  
104 unsubstituted  $-\text{N}(\text{H})-\text{C}(=\text{O})-\text{alkyl}$  groups, substituted and  
105 unsubstituted  $-\text{N}(\text{H})-\text{C}(=\text{O})-\text{heterocycl}$  groups, and substituted  
106 and unsubstituted  $-\text{N}(\text{H})-\text{C}(=\text{O})-\text{heterocyclalkyl}$  groups;
- 107  $\text{R}^7$  is selected from the group consisting of  $-\text{H}$ ,  $-\text{F}$ ,  $-\text{Cl}$ ,  $-\text{Br}$ ,  $-\text{I}$ ,  
108  $-\text{CN}$ ,  $-\text{NO}_2$ , substituted and unsubstituted alkyl groups having  
109 from 1 to 12 carbon atoms, substituted and unsubstituted  
110 alkenyl groups having from 1 to 12 carbon atoms, substituted  
111 and unsubstituted heterocycl groups, substituted and  
112 unsubstituted heterocyclalkyl groups,  $-\text{OH}$ , substituted and  
113 unsubstituted alkoxy groups, substituted and unsubstituted  
114 heterocycloxy groups, substituted and unsubstituted  
115 heterocyclalkoxy groups,  $-\text{SH}$ , substituted and unsubstituted  
116  $-\text{S}-\text{alkyl}$  groups,  $-\text{CO}_2\text{H}$ ,  $-\text{C}(=\text{O})-\text{NH}_2$ , substituted and  
117 unsubstituted  $-\text{C}(=\text{O})-\text{N}(\text{H})(\text{alkyl})$  groups, substituted and  
118 unsubstituted  $-\text{C}(=\text{O})-\text{N}(\text{alkyl})_2$  groups, substituted and  
119 unsubstituted  $-\text{C}(=\text{O})-\text{N}(\text{H})(\text{heterocycl})$  groups,  
120  $-\text{C}(=\text{O})-\text{N}(\text{H})(\text{heterocyclalkyl})$  groups, substituted and

121 unsubstituted -C(=O)-O-alkyl groups, substituted and  
122 unsubstituted -C(=O)-O-heterocyclyl groups, substituted and  
123 unsubstituted -C(=O)-O-heterocyclylalkyl groups, substituted  
124 and unsubstituted -C(=O)-alkyl groups, substituted and  
125 unsubstituted -C(=O)-heterocyclyl groups, substituted and  
126 unsubstituted -C(=O)-heterocyclylalkyl groups, -NH<sub>2</sub>, substituted  
127 and unsubstituted -N(H)(alkyl) groups, substituted and  
128 unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
129 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
130 -N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
131 -N(heterocyclyl)<sub>2</sub> groups, substituted and unsubstituted  
132 -N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
133 -N(alkyl)(heterocyclylalkyl) groups, substituted and unsubstituted  
134 -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and unsubstituted  
135 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
136 -N(H)-C(=O)-heterocyclyl groups, and substituted and  
137 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups; or R<sup>7</sup> may  
138 be absent if C is nitrogen;

139 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
140 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
141 substituted and unsubstituted alkenyl groups having from 1 to 12  
142 carbon atoms, substituted and unsubstituted aryl groups,  
143 substituted and unsubstituted aralkyl groups, substituted and  
144 unsubstituted heterocyclyl groups, substituted and unsubstituted  
145 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
146 alkoxy groups, substituted and unsubstituted aryloxy groups,  
147 substituted and unsubstituted arylalkoxy groups, substituted and  
148 unsubstituted heterocyclyloxy groups, substituted and  
149 unsubstituted heterocyclylalkoxy groups, substituted and  
150 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
151 -C(=O)-aryl groups, substituted and unsubstituted -C(=O)-aralkyl

152 groups, substituted and unsubstituted -C(=O)-heterocycl  
153 groups, and substituted and unsubstituted  
154 -C(=O)-heterocyclalkyl groups; or R<sup>9</sup> and R<sup>10</sup> join together to  
155 form a ring having 5, 6, or 7 ring members; and

156 R<sup>10</sup> is -H, or R<sup>9</sup> and R<sup>10</sup> join together to form a ring having 5, 6,  
157 or 7 ring members.

1 25. The method of claim 24, wherein

2 R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 substituted and unsubstituted alkyl groups having from 1 to 12  
4 carbon atoms, substituted and unsubstituted heterocycl  
5 groups, substituted and unsubstituted heterocyclalkyl groups,  
6 -OH, substituted and unsubstituted alkoxy groups, substituted  
7 and unsubstituted heterocycloxy groups, and substituted and  
8 unsubstituted heterocyclalkoxy groups;

9 R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting  
10 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
11 alkyl groups having from 1 to 12 carbon atoms, substituted and  
12 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
13 substituted and unsubstituted aryl groups, substituted and  
14 unsubstituted aralkyl groups, substituted and unsubstituted  
15 heterocycl groups, substituted and unsubstituted  
16 heterocyclalkyl groups, -OH, substituted and unsubstituted  
17 alkoxy groups, substituted and unsubstituted heterocycloxy  
18 groups, substituted and unsubstituted heterocyclalkoxy  
19 groups, and -CO<sub>2</sub>H; or R<sup>2</sup> and R<sup>3</sup> may join together to form a  
20 cyclic group

21  $R^6$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
22 substituted and unsubstituted alkyl groups having from 1 to 8  
23 carbon atoms, substituted and unsubstituted heterocyclyl  
24 groups, -OH, substituted and unsubstituted alkoxy groups,  
25 substituted and unsubstituted heterocyclyloxy groups, and  
26 substituted and unsubstituted heterocyclylalkoxy groups; or  $R^6$   
27 may be absent if B is nitrogen;

28  $R^7$  is selected from the group consisting -H, -F, -Cl, -Br, -I,  
29 substituted and unsubstituted alkyl groups having from 1 to 8  
30 carbon atoms, substituted and unsubstituted heterocyclyl  
31 groups, -OH, substituted and unsubstituted alkoxy groups,  
32 substituted and unsubstituted heterocyclyloxy groups, and  
33 substituted and unsubstituted heterocyclylalkoxy groups; or  $R^7$   
34 may be absent if C is nitrogen.

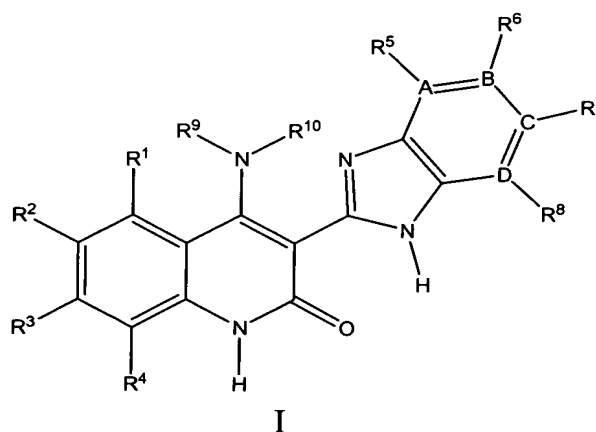
1 26. The method of claim 24, wherein  $R^9$  is selected from the  
2 group consisting of -H, substituted and unsubstituted straight or branched  
3 chain alkyl groups having from 1-12 carbon atoms, substituted and  
4 unsubstituted cycloalkyl groups, substituted and unsubstituted aryl groups,  
5 substituted and unsubstituted aralkyl groups, substituted and unsubstituted  
6 saturated heterocyclyl groups, substituted and unsubstituted heterocyclylalkyl  
7 groups wherein the heterocyclyl moiety is saturated, substituted and  
8 unsubstituted alkoxy groups, and substituted and unsubstituted  
9 heterocyclylalkoxy groups wherein the heterocyclyl moiety is saturated.

1 27. The method of claim 24, wherein  $R^1$  is selected from the  
2 group consisting of -H, -F, -Cl, substituted and unsubstituted morpholinyl  
3 groups, substituted and unsubstituted morpholinylalkyl groups, and  
4 substituted and unsubstituted morpholinylalkoxy groups.



1                    28.    The method of claim 24, wherein  $R^2$  is selected from the  
2    group consisting of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CH<sub>3</sub>, -OCH<sub>3</sub>, -CO<sub>2</sub>H, substituted  
3    and unsubstituted aryl groups, and substituted and unsubstituted pyridinyl  
4    groups.

1                    29.    A method of inhibiting a serine/threonine kinase in a  
2    subject or treating a biological condition mediated by a serine/threonine  
3    kinase in a subject, comprising: administering to the subject a compound of  
4    Structure I, a tautomer of the compound, a pharmaceutically acceptable salt  
5    of the compound, a pharmaceutically acceptable salt of the tautomer, or  
6    mixtures thereof wherein Structure I has the following formula and the  
7    serine/threonine kinase is PAR-1



8

9

wherein,

10

11

A, B, C, and D are independently selected from the group  
consisting of carbon and nitrogen;

12

13

14

15

$R^1$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
-CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
from 1 to 12 carbon atoms, substituted and unsubstituted  
alkenyl groups having from 1 to 12 carbon atoms, substituted

16 and unsubstituted heterocyclyl groups, and substituted and  
17 unsubstituted heterocyclylalkyl groups;

18  $R^2$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
19 -NO<sub>2</sub>, -CN, substituted and unsubstituted alkyl groups having  
20 from 1 to 12 carbon atoms, substituted and unsubstituted  
21 alkenyl groups having from 1 to 12 carbon atoms, substituted  
22 and unsubstituted aryl groups, substituted and unsubstituted  
23 aralkyl groups, -OH, substituted and unsubstituted alkoxy,  
24 substituted and unsubstituted heterocyclyloxy, substituted and  
25 unsubstituted heterocyclylalkoxy, substituted and unsubstituted  
26 -C(=O)-alkyl groups, substituted and unsubstituted -C(=O)-aryl,  
27 substituted and unsubstituted -C(=O)-aralkyl, -CO<sub>2</sub>H, substituted  
28 and unsubstituted -C(=O)-O-alkyl groups, substituted and  
29 unsubstituted -C(=O)-O-aryl groups, and substituted and  
30 unsubstituted -C(=O)-O-aralkyl groups;

31  $R^3$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
32 -NO<sub>2</sub>, -CN, substituted and unsubstituted alkyl groups having  
33 from 1 to 12 carbon atoms, substituted and unsubstituted  
34 alkenyl groups having from 1 to 12 carbon atoms, substituted  
35 and unsubstituted aryl groups, substituted and unsubstituted  
36 aralkyl groups, substituted and unsubstituted heterocyclyl  
37 groups, substituted and unsubstituted heterocyclylalkyl groups,  
38 -SH, substituted and unsubstituted -S-alkyl groups, substituted  
39 and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
40 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
41 unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>,  
42 substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups,  
43 substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups,  
44 substituted and unsubstituted -S(=O)-alkyl groups, substituted

45 and unsubstituted  $-S(=O)-$ aryl groups, substituted and  
46 unsubstituted  $-S(=O)-$ heterocyclyl groups,  $-OH$ , substituted and  
47 unsubstituted alkoxy groups, substituted and unsubstituted  
48 aryloxy groups, substituted and unsubstituted heterocyclyloxy  
49 groups, substituted and unsubstituted heterocyclalkoxy  
50 groups,  $-NH_2$ , substituted and unsubstituted  $-N(H)(alkyl)$  groups,  
51 substituted and unsubstituted  $-N(alkyl)_2$  groups, substituted and  
52 unsubstituted  $-N(H)(aryl)$  groups, substituted and unsubstituted  
53  $-N(alkyl)(aryl)$  groups, substituted and unsubstituted  $-N(aryl)_2$   
54 groups, substituted and unsubstituted  $-N(H)(aralkyl)$  groups,  
55 substituted and unsubstituted  $-N(alkyl)(aralkyl)$  groups,  
56 substituted and unsubstituted  $-N(aralkyl)_2$  groups, substituted  
57 and unsubstituted  $-N(H)(heterocyclyl)$  groups, substituted and  
58 unsubstituted  $-N(alkyl)(heterocyclyl)$  groups, substituted and  
59 unsubstituted  $-N(heterocyclyl)_2$  groups, substituted and  
60 unsubstituted  $-N(H)(heterocyclalkyl)$  groups, substituted and  
61 unsubstituted  $-N(alkyl)(heterocyclalkyl)$  groups, substituted and  
62 unsubstituted  $-N(heterocyclalkyl)_2$  groups, substituted and  
63 unsubstituted  $-N(H)-C(=O)-alkyl$  groups, substituted and  
64 unsubstituted  $-N(alkyl)-C(=O)-alkyl$  groups, substituted and  
65 unsubstituted  $-N(H)-C(=O)-aryl$  groups, substituted and  
66 unsubstituted  $-N(alkyl)-C(=O)-aryl$  groups, substituted and  
67 unsubstituted  $-N(H)-C(=O)-aralkyl$  groups, substituted and  
68 unsubstituted  $-N(alkyl)-C(=O)-aralkyl$  groups, substituted and  
69 unsubstituted  $-N(H)-C(=O)-heterocyclyl$  groups, substituted and  
70 unsubstituted  $-N(alkyl)-C(=O)-heterocyclyl$  groups, substituted  
71 and unsubstituted  $-N(H)-C(=O)-heterocyclalkyl$  groups,  
72 substituted and unsubstituted  $-N(alkyl)-C(=O)-heterocyclalkyl$   
73 groups, substituted and unsubstituted  $-N(H)-S(=O)_2-alkyl$   
74 groups, substituted and unsubstituted  $-N(H)-S(=O)_2-aryl$ ,  
75 substituted and unsubstituted  $-N(H)-S(=O)_2-heterocyclyl$  groups,  
76 substituted and unsubstituted  $-C(=O)-alkyl$  groups, substituted

77 and unsubstituted -C(=O)-aryl, substituted and unsubstituted  
78 -C(=O)-aralkyl, substituted and unsubstituted  
79 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
80 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
81 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
82 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
83 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
84 unsubstituted -C(=O)-N(alkyl)(aryl) groups, substituted and  
85 unsubstituted -C(=O)-N(aryl)<sub>2</sub> groups, substituted and  
86 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
87 unsubstituted -C(=O)-N(alkyl)(aralkyl) groups, substituted and  
88 unsubstituted -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
89 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
90 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
91 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
92 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,  
93 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl)  
94 groups, substituted and unsubstituted -  
95 C(=O)-N(heterocyclylalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
96 unsubstituted -C(=O)-O-alkyl groups, substituted and  
97 unsubstituted -C(=O)-O-aryl groups, substituted and  
98 unsubstituted -C(=O)-O-aralkyl groups, substituted and  
99 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
100 and unsubstituted -C(=O)-O-heterocyclylalkyl groups;

101 R<sup>4</sup>, R<sup>5</sup> and R<sup>8</sup> are independently selected from the group  
102 consisting of -H and substituted and unsubstituted alkyl groups  
103 having from 1 to 12 carbon atoms; or R<sup>5</sup> may be absent if A is  
104 nitrogen; or R<sup>8</sup> may be absent if D is nitrogen;

105  $R^6$  and  $R^7$  are independently selected from the group consisting  
106 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
107 alkyl groups having from 1 to 12 carbon atoms, substituted and  
108 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
109 substituted and unsubstituted heterocyclyl groups, substituted  
110 and unsubstituted heterocyclylalkyl groups, -SH, substituted and  
111 unsubstituted -S-alkyl groups, substituted and unsubstituted  
112 -S-heterocyclyl groups, -OH, substituted and unsubstituted  
113 alkoxy groups, substituted and unsubstituted heterocycloxy  
114 groups, substituted and unsubstituted heterocyclalkoxy  
115 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
116 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
117 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
118 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
119 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
120 unsubstituted -N(H)(heterocyclalkyl) groups, substituted and  
121 unsubstituted -N(alkyl)(heterocyclalkyl) groups, and substituted  
122 and unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups; or  $R^6$  is absent  
123 if B is nitrogen; or  $R^7$  is absent if C is nitrogen;

124  $R^9$  is selected from the group consisting of -H, substituted and  
125 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
126 substituted and unsubstituted alkenyl groups having from 1 to 12  
127 carbons, substituted and unsubstituted aryl groups, substituted  
128 and unsubstituted aralkyl groups, substituted and unsubstituted  
129 heterocyclyl groups, substituted and unsubstituted  
130 heterocyclalkyl groups, -OH, substituted and unsubstituted  
131 alkoxy groups, and substituted and unsubstituted  
132 heterocyclalkoxy groups; and

133  $R^{10}$  is -H.

1           30.     The method of claim 29, wherein

2           R<sup>3</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3           -NO<sub>2</sub>, -CN, substituted and unsubstituted alkyl groups having  
4           from 1 to 12 carbon atoms, substituted and unsubstituted  
5           alkenyl groups having from 1 to 12 carbon atoms, substituted  
6           and unsubstituted aryl groups, substituted and unsubstituted  
7           aralkyl groups, substituted and unsubstituted heterocyclyl  
8           groups, substituted and unsubstituted heterocyclylalkyl groups,  
9           -OH, substituted and unsubstituted alkoxy groups, substituted  
10          and unsubstituted aryloxy groups, substituted and unsubstituted  
11          heterocycliloxy groups, substituted and unsubstituted  
12          heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
13          -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
14          groups, substituted and unsubstituted -N(H)(aryl) groups,  
15          substituted and unsubstituted -N(alkyl)(aryl) groups, substituted  
16          and unsubstituted -N(aryl)<sub>2</sub> groups, substituted and  
17          unsubstituted -N(H)(aralkyl) groups, substituted and  
18          unsubstituted -N(alkyl)(aralkyl) groups, substituted and  
19          unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted and unsubstituted  
20          -N(H)(heterocyclyl) groups, substituted and unsubstituted  
21          -N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
22          -N(heterocyclyl)<sub>2</sub> groups, substituted and unsubstituted  
23          -N(H)(heterocyclylalkyl) groups, substituted and unsubstituted  
24          -N(alkyl)(heterocyclylalkyl) groups, substituted and unsubstituted  
25          -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and unsubstituted  
26          -C(=O)-alkyl groups, substituted and unsubstituted  
27          -C(=O)-heterocyclyl groups, substituted and unsubstituted  
28          -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
29          unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
30          unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and

31 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
32 unsubstituted -C(=O)-N(alkyl)(aryl) groups, substituted and  
33 unsubstituted -C(=O)-N(aryl)<sub>2</sub> groups, substituted and  
34 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
35 unsubstituted -C(=O)-N(alkyl)(aralkyl) groups, substituted and  
36 unsubstituted -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
37 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
38 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
39 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
40 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,  
41 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl)  
42 groups, substituted and unsubstituted  
43 -C(=O)-N(heterocyclylalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
44 unsubstituted -C(=O)-O-alkyl groups, substituted and  
45 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
46 and unsubstituted -C(=O)-O-heterocyclylalkyl groups;

47 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
48 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
49 alkyl groups having from 1 to 12 carbon atoms, substituted and  
50 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
51 substituted and unsubstituted heterocyclyl groups, substituted  
52 and unsubstituted heterocyclylalkyl groups, -OH, substituted and  
53 unsubstituted alkoxy groups, substituted and unsubstituted  
54 heterocyclyoxy groups, and substituted and unsubstituted  
55 heterocyclylalkoxy groups; or R<sup>6</sup> is absent if B is nitrogen; or R<sup>7</sup>  
56 is absent if C is nitrogen.

1 31. The method of claim 29, wherein R<sup>9</sup> is selected from the  
2 group consisting of -H, substituted and unsubstituted straight and branched  
3 chain alkyl groups having from 1 to 8 carbon atoms, substituted and

4 unsubstituted cycloalkyl groups, substituted and unsubstituted heterocyclyl  
5 groups, and substituted and unsubstituted heterocyclylalkyl groups.

1                   32. The method of claim 29, wherein R<sup>1</sup> is selected from the  
2 group consisting of -H, -F, -Cl, -Br, -I, substituted and unsubstituted straight  
3 and branched chain alkyl groups having from 1 to 8 carbon atoms, substituted  
4 and unsubstituted cycloalkyl groups, and substituted and unsubstituted  
5 heterocyclyl groups.

1                   33. The method of claim 29, wherein R<sup>2</sup> is selected from the  
2 group consisting of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and  
3 unsubstituted straight and branched chain alkyl groups having from 1 to 12  
4 carbon atoms, substituted and unsubstituted cycloalkyl groups, substituted  
5 and unsubstituted aryl groups, and substituted and unsubstituted aralkyl  
6 groups.

1                   34. The method of claim 29, wherein R<sup>3</sup> is selected from the  
2 group consisting of -H, -F, -Cl, -Br, -I, -CN, substituted and unsubstituted  
3 straight or branched chain alkyl groups having from 1 to 8 carbon atoms,  
4 substituted and unsubstituted cycloalkyl groups, substituted and unsubstituted  
5 aryl groups, substituted and unsubstituted aralkyl groups, substituted and  
6 unsubstituted heterocyclyl groups, substituted and unsubstituted  
7 heterocyclylalkyl groups, -OH, substituted and unsubstituted alkoxy groups,  
8 substituted and unsubstituted heterocycloxy groups, substituted and  
9 unsubstituted heterocyclylalkoxy groups, substituted and unsubstituted  
10 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, and  
11 substituted and unsubstituted -N(H)(heterocyclylalkyl) groups.

1                   35. The method of claim 29, R<sup>6</sup> and R<sup>7</sup> are independently  
2 selected from the group consisting of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted  
3 and unsubstituted straight or branched chain alkyl groups having from 1 to 8



4 carbon atoms, substituted and unsubstituted cycloalkyl groups, substituted  
5 and unsubstituted heterocyclyl groups, substituted and unsubstituted  
6 heterocyclylalkyl groups, -OH, substituted and unsubstituted alkoxy groups,  
7 substituted and unsubstituted heterocyclyloxy groups, and substituted and  
8 unsubstituted heterocyclylalkoxy groups; or R<sup>6</sup> is absent if B is nitrogen; or R<sup>7</sup>  
9 is absent if C is nitrogen.

1 36. The method of any of claims 3, 8, 13, 24, or 29, wherein  
2 R<sup>9</sup> is selected from the group consisting of quinuclidinyl groups, piperidinyl  
3 groups, piperidinylalkyl groups, pyrrolidinyl groups, and aminocyclohexyl  
4 groups.

1 37. The method of any of claims 3 or 13, wherein A, B, C,  
2 and D are all carbon, and R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>10</sup> are all -H.

1 38. The method of any of claims 3, 8, 13, 24, or 29, wherein  
2 the IC<sub>50</sub> value of the compound is less than or equal to 0.1 μM with respect to  
3 the serine/threonine kinase.

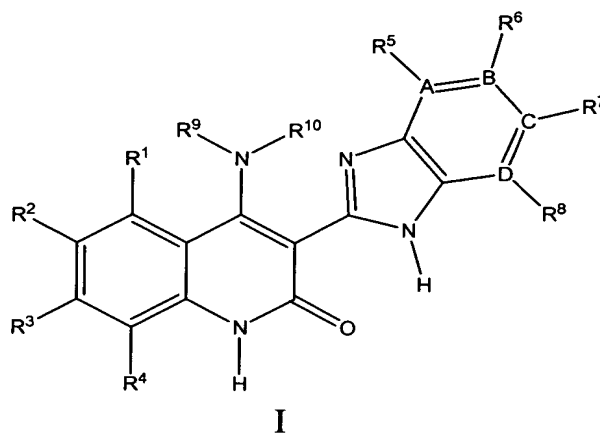
1 39. The method of any of claims 3, 8, 24, or 29, wherein the  
2 biological condition is diabetes.

1 40. The method of any of claims 3, 8, 13, 24, or 29, wherein  
2 the biological condition is Alzheimer's disease.

1 41. The method of claims 1, 3, 8, 13, 24, or 29, wherein  
2 administration of the compound to the subject reduces tau phosphorylation.

1 42. A method of inhibiting a tyrosine kinase in a subject or  
2 treating a biological condition mediated by the tyrosine kinase in a subject,  
3 comprising: administering to the subject a compound of Structure I, a

4 tautomer of the compound, a pharmaceutically acceptable salt of the  
5 compound, a pharmaceutically acceptable salt of the tautomer, or mixtures  
6 thereof, wherein the tyrosine kinase is selected from the group consisting of  
7 cell cycle division 2 kinase, Fyn, Lck, c-Kit, c-ABL, VEGFR3, PDGFR $\alpha$ ,  
8 PDGFR $\beta$ , FGFR3, FLT-3, p60src, and Tie-2 and Structure I has the following  
9 formula



10

11

wherein,

12

A, B, C, and D are independently selected from the group  
13 consisting of carbon and nitrogen;

14

R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
15 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
16 from 1 to 12 carbon atoms, substituted and unsubstituted  
17 alkenyl groups having from 1 to 12 carbon atoms, substituted  
18 and unsubstituted aryl groups, substituted and unsubstituted  
19 aralkyl groups, substituted and unsubstituted heterocycl  
20 groups, substituted and unsubstituted heterocyclalkyl groups,  
21 -SH, substituted and unsubstituted -S-alkyl groups, substituted  
22 and unsubstituted -S-heterocycl groups, -OH, substituted and  
23 unsubstituted alkoxy groups, substituted and unsubstituted  
24 heterocycloxy groups, substituted and unsubstituted

25 heterocyclalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
26 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
27 groups, substituted and unsubstituted -N(H)(heterocycl)  
28 groups, substituted and unsubstituted -N(alkyl)(heterocycl)  
29 groups, substituted and unsubstituted -N(heterocycl)<sub>2</sub> groups,  
30 substituted and unsubstituted -N(H)(heterocyclalkyl) groups,  
31 substituted and unsubstituted -N(alkyl)(heterocyclalkyl) groups,  
32 substituted and unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups,  
33 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
34 substituted and unsubstituted -N(H)-C(=O)-heterocycl groups,  
35 substituted and unsubstituted -N(H)-C(=O)-heterocyclalkyl  
36 groups, substituted and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-alkyl  
37 groups, substituted and unsubstituted  
38 -N(alkyl)-S(=O)<sub>2</sub>-heterocycl groups, substituted and  
39 unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocyclalkyl groups,  
40 substituted and unsubstituted -C(=O)-alkyl groups, substituted  
41 and unsubstituted -C(=O)-heterocycl groups, substituted and  
42 unsubstituted -C(=O)-heterocyclalkyl groups, -C(=O)-NH<sub>2</sub>,  
43 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
44 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
45 substituted and unsubstituted -C(=O)-N(H)(heterocycl) groups,  
46 substituted and unsubstituted -C(=O)-N(alkyl)(heterocycl)  
47 groups, substituted and unsubstituted -C(=O)-N(heterocycl)<sub>2</sub>  
48 groups, substituted and unsubstituted  
49 -C(=O)-N(H)(heterocyclalkyl) groups, substituted and  
50 unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl) groups,  
51 substituted and unsubstituted -C(=O)-N(heterocyclalkyl)<sub>2</sub>  
52 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
53 groups, substituted and unsubstituted -C(=O)-O-heterocycl  
54 groups, and substituted and unsubstituted  
55 -C(=O)-O-heterocyclalkyl groups;

56  $R^2$  and  $R^3$  are independently selected from the group consisting  
57 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
58 alkyl groups having from 1 to 12 carbon atoms, substituted and  
59 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
60 substituted and unsubstituted aryl groups, substituted and  
61 unsubstituted aralkyl groups, substituted and unsubstituted  
62 heterocyclyl groups, substituted and unsubstituted  
63 heterocyclylalkyl groups, -SH, substituted and unsubstituted -S-  
64 alkyl groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl  
65 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups,  
66 substituted and unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups,  
67 -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl)  
68 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups,  
69 substituted and unsubstituted -S(=O)-alkyl groups, substituted  
70 and unsubstituted -S(=O)-heterocyclyl groups, -OH, substituted  
71 and unsubstituted alkoxy groups, substituted and unsubstituted  
72 aryloxy groups, substituted and unsubstituted heterocyclyloxy  
73 groups, substituted and unsubstituted heterocyclylalkoxy  
74 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
75 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
76 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
77 -N(alkyl)(aryl) groups, substituted and unsubstituted -N(aryl)<sub>2</sub>  
78 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
79 substituted and unsubstituted -N(alkyl)(aralkyl) groups,  
80 substituted and unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted  
81 and unsubstituted -N(H)(heterocyclyl) groups, substituted and  
82 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
83 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
84 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
85 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
86 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
87 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and

88 unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
89 unsubstituted -N(H)-C(=O)-aryl groups, substituted and  
90 unsubstituted -N(alkyl)-C(=O)-aryl groups, substituted and  
91 unsubstituted -N(H)-C(=O)-aralkyl groups, substituted and  
92 unsubstituted -N(alkyl)-C(=O)-aralkyl groups, substituted and  
93 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
94 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
95 and unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups,  
96 substituted and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl  
97 groups, substituted and unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl  
98 groups, substituted and unsubstituted -N(H)-S(=O)<sub>2</sub>-aryl,  
99 substituted and unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclyl groups,  
100 substituted and unsubstituted -C(=O)-alkyl groups, substituted  
101 and unsubstituted -C(=O)-aryl, substituted and unsubstituted  
102 -C(=O)-aralkyl, substituted and unsubstituted  
103 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
104 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
105 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
106 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
107 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
108 unsubstituted -C(=O)-N(alkyl)(aryl) groups, substituted and  
109 unsubstituted -C(=O)-N(aryl)<sub>2</sub> groups, substituted and  
110 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
111 unsubstituted -C(=O)-N(alkyl)(aralkyl) groups, substituted and  
112 unsubstituted -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
113 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
114 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
115 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
116 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,  
117 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl)  
118 groups, substituted and unsubstituted -  
119 C(=O)-N(heterocyclylalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and

- 120 unsubstituted -C(=O)-O-alkyl groups, C(=O)-O-aryl groups -  
121 C(=O)-O-alkyl groups, substituted and unsubstituted  
122 -C(=O)-O-heterocyclyl groups, and substituted and  
123 unsubstituted -C(=O)-O-heterocyclylalkyl groups;
- 124  $R^4$  is selected from the group consisting of -H and substituted  
125 and unsubstituted alkyl groups having from 1 to 12 carbon  
126 atoms;
- 127  $R^5$  and  $R^8$  are independently selected from the group consisting  
128 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
129 alkyl groups having from 1 to 12 carbon atoms, substituted and  
130 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
131 substituted and unsubstituted heterocyclyl groups, substituted  
132 and unsubstituted heterocyclylalkyl groups, -OH, substituted and  
133 unsubstituted alkoxy groups, substituted and unsubstituted  
134 heterocycliloxy groups, substituted and unsubstituted  
135 heterocyclylalkoxy groups; or  $R^5$  may be absent if A is nitrogen;  
136 or  $R^8$  may be absent if D is nitrogen;
- 137  $R^6$  and  $R^7$  are independently selected from the group consisting  
138 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
139 alkyl groups having from 1 to 12 carbon atoms, substituted and  
140 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
141 substituted and unsubstituted aryl groups, substituted and  
142 unsubstituted arylalkyl groups, substituted and unsubstituted  
143 heterocyclyl groups, substituted and unsubstituted  
144 heterocyclylalkyl groups, -SH, substituted and unsubstituted  
145 -S-alkyl groups, substituted and unsubstituted -S-heterocyclyl  
146 groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and unsubstituted  
147 -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and unsubstituted

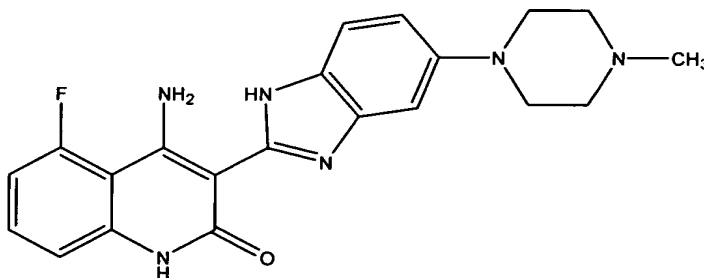
148 -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and unsubstituted  
149 alkoxy groups, substituted and unsubstituted heterocycloxy  
150 groups, substituted and unsubstituted heterocyclalkoxy  
151 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
152 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
153 unsubstituted -N(H)(heterocycl) groups, substituted and  
154 unsubstituted -N(alkyl)(heterocycl) groups, substituted and  
155 unsubstituted -N(heterocycl)<sub>2</sub> groups, substituted and  
156 unsubstituted -N(H)(heterocyclalkyl) groups, substituted and  
157 unsubstituted -N(alkyl)(heterocyclalkyl) groups, substituted and  
158 unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups, substituted and  
159 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
160 unsubstituted -N(H)-C(=O)-heterocycl groups, substituted and  
161 unsubstituted -N(H)-C(=O)-heterocyclalkyl groups, substituted  
162 and unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
163 unsubstituted -N(alkyl)-C(=O)-heterocycl groups, substituted  
164 and unsubstituted -N(alkyl)-C(=O)-heterocyclalkyl, substituted  
165 and unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
166 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocycl groups, substituted and  
167 unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocyclalkyl groups, substituted  
168 and unsubstituted -C(=O)-alkyl groups, substituted and  
169 unsubstituted -C(=O)-heterocycl groups, substituted and  
170 unsubstituted -C(=O)-heterocyclalkyl groups, -C(=O)-NH<sub>2</sub>,  
171 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
172 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
173 substituted and unsubstituted -C(=O)-N(H)(heterocycl) groups,  
174 substituted and unsubstituted -C(=O)-N(alkyl)(heterocycl)  
175 groups, substituted and unsubstituted -C(=O)-N(heterocycl)<sub>2</sub>  
176 groups, substituted and unsubstituted  
177 -C(=O)-N(H)(heterocyclalkyl) groups, substituted and  
178 unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl) groups,  
179 substituted and unsubstituted -C(=O)-N(heterocyclalkyl)<sub>2</sub>

180 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
181 groups, substituted and unsubstituted -C(=O)-O-heterocyclyl  
182 groups, and substituted and unsubstituted  
183 -C(=O)-O-heterocyclylalkyl groups; or R<sup>6</sup> is absent if B is  
184 nitrogen; or R<sup>7</sup> is absent if C is nitrogen;

185 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
186 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
187 substituted and unsubstituted alkenyl groups having from 1 to 12  
188 carbons, substituted and unsubstituted aryl groups, substituted  
189 and unsubstituted aralkyl groups, substituted and unsubstituted  
190 heterocyclyl groups, substituted and unsubstituted  
191 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
192 alkoxy groups, substituted and unsubstituted heterocycloxy  
193 groups, -NH<sub>2</sub>, and substituted and unsubstituted  
194 heterocyclylaminoalkyl; and

195 R<sup>10</sup> is -H.

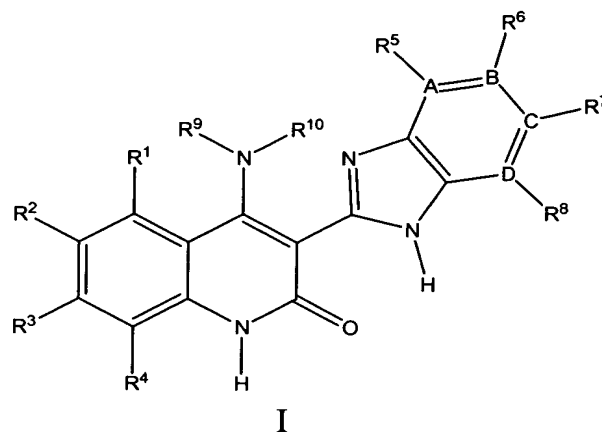
1 43. The method of claim 42, wherein the compound has the  
2 following formula



1 44. A method of inhibiting a tyrosine kinase in a subject or  
2 treating a biological condition mediated by the tyrosine kinase in a subject,  
3 comprising: administering to the subject a compound of Structure I, a  
4 tautomer of the compound, a pharmaceutically acceptable salt of the



5 compound, a pharmaceutically acceptable salt of the tautomer, or mixtures  
6 thereof wherein the tyrosine kinase is cell cycle division 2 kinase, stem cell  
7 factor receptor, stem cell tyrosine kinase I, and Structure I has the following  
8 formula



9

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wherein,

11

A, B, C, and D are independently selected from the group  
12 consisting of carbon and nitrogen;

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R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having from 1 to 12 carbon atoms, substituted and unsubstituted alkenyl groups having from 1 to 12 carbon atoms, substituted and unsubstituted heterocyclyl groups, substituted and unsubstituted heterocyclylalkyl groups, -SH, substituted and unsubstituted -S-alkyl groups, substituted and unsubstituted -S-heterocyclyl groups, -OH, substituted and unsubstituted alkoxy groups, substituted and unsubstituted heterocycloxy groups, substituted and unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted -N(H)(heterocyclyl) groups, substituted and

26 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
27 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
28 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
29 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
30 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
31 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
32 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
33 unsubstituted -N(H)-C(=O)-heterocyclylalkyl groups, substituted  
34 and unsubstituted -C(=O)-alkyl groups, substituted and  
35 unsubstituted -C(=O)-heterocyclyl groups, substituted and  
36 unsubstituted -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>,  
37 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
38 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
39 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
40 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclyl)  
41 groups, substituted and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub>  
42 groups, substituted and unsubstituted  
43 -C(=O)-N(H)(heterocyclylalkyl) groups, substituted and  
44 unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl) groups,  
45 substituted and unsubstituted -C(=O)-N(heterocyclylalkyl)<sub>2</sub>  
46 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
47 groups, substituted and unsubstituted -C(=O)-O-heterocyclyl  
48 groups, and substituted and unsubstituted  
49 -C(=O)-O-heterocyclylalkyl groups;

50 R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting  
51 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
52 alkyl groups having from 1 to 12 carbon atoms, substituted and  
53 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
54 substituted and unsubstituted aryl groups, substituted and  
55 unsubstituted aralkyl groups, substituted and unsubstituted  
56 heterocyclyl groups, substituted and unsubstituted

57 heterocyclalkyl groups, -SH, substituted and unsubstituted -S-  
58 alkyl groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl  
59 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups,  
60 substituted and unsubstituted -S(=O)<sub>2</sub>-heterocycl groups,  
61 -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl)  
62 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups,  
63 substituted and unsubstituted -S(=O)-alkyl groups, substituted  
64 and unsubstituted -S(=O)-heterocycl groups, -OH, substituted  
65 and unsubstituted alkoxy groups, substituted and unsubstituted  
66 aryloxy groups, substituted and unsubstituted heterocyclloxy  
67 groups, substituted and unsubstituted heterocyclalkoxy  
68 groups, -NH<sub>2</sub>, substituted and unsubstituted -N(H)(alkyl) groups,  
69 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
70 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
71 -N(alkyl)(aryl) groups, substituted and unsubstituted -N(aryl)<sub>2</sub>  
72 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
73 substituted and unsubstituted -N(alkyl)(aralkyl) groups,  
74 substituted and unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted  
75 and unsubstituted -N(H)(heterocycl) groups, substituted and  
76 unsubstituted -N(alkyl)(heterocycl) groups, substituted and  
77 unsubstituted -N(heterocycl)<sub>2</sub> groups, substituted and  
78 unsubstituted -N(H)(heterocyclalkyl) groups, substituted and  
79 unsubstituted -N(alkyl)(heterocyclalkyl) groups, substituted and  
80 unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups, substituted and  
81 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
82 unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
83 unsubstituted -N(H)-C(=O)-aryl groups, substituted and  
84 unsubstituted -N(alkyl)-C(=O)-aryl groups, substituted and  
85 unsubstituted -N(H)-C(=O)-aralkyl groups, substituted and  
86 unsubstituted -N(alkyl)-C(=O)-aralkyl groups, substituted and  
87 unsubstituted -N(H)-C(=O)-heterocycl groups, substituted and  
88 unsubstituted -N(alkyl)-C(=O)-heterocycl groups, substituted

89 and unsubstituted -N(H)-C(=O)-heterocyclalkyl groups,  
90 substituted and unsubstituted -N(alkyl)-C(=O)-heterocyclalkyl  
91 groups, substituted and unsubstituted -N(H)-S(=O)<sub>2</sub>-alkyl  
92 groups, substituted and unsubstituted -N(H)-S(=O)<sub>2</sub>-aryl,  
93 substituted and unsubstituted -N(H)-S(=O)<sub>2</sub>-heterocycl groups,  
94 substituted and unsubstituted -C(=O)-alkyl groups, substituted  
95 and unsubstituted -C(=O)-aryl, substituted and unsubstituted  
96 -C(=O)-aralkyl, substituted and unsubstituted  
97 -C(=O)-heterocycl groups, substituted and unsubstituted  
98 -C(=O)-heterocyclalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
99 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
100 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
101 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
102 unsubstituted -C(=O)-N(alkyl)(aryl) groups, substituted and  
103 unsubstituted -C(=O)-N(aryl)<sub>2</sub> groups, substituted and  
104 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
105 unsubstituted -C(=O)-N(alkyl)(aralkyl) groups, substituted and  
106 unsubstituted -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
107 unsubstituted -C(=O)-N(H)(heterocycl) groups, substituted and  
108 unsubstituted -C(=O)-N(alkyl)(heterocycl) groups, substituted  
109 and unsubstituted -C(=O)-N(heterocycl)<sub>2</sub> groups, substituted  
110 and unsubstituted -C(=O)-N(H)(heterocyclalkyl) groups,  
111 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl)  
112 groups, substituted and unsubstituted -  
113 C(=O)-N(heterocyclalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
114 unsubstituted -C(=O)-O-alkyl groups, C(=O)-O-aryl groups -  
115 C(=O)-O-aralkyl groups, substituted and unsubstituted  
116 -C(=O)-O-heterocycl groups, and substituted and  
117 unsubstituted -C(=O)-O-heterocyclalkyl groups;

118  $R^4$  is selected from the group consisting of -H and substituted  
119 and unsubstituted alkyl groups having from 1 to 12 carbon  
120 atoms;

121  $R^5$  and  $R^8$  are independently selected from the group consisting  
122 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
123 alkyl groups having from 1 to 12 carbon atoms, substituted and  
124 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
125 substituted and unsubstituted heterocyclyl groups, substituted  
126 and unsubstituted heterocyclylalkyl groups, -OH, substituted and  
127 unsubstituted alkoxy groups, substituted and unsubstituted  
128 heterocycloxy groups, and substituted and unsubstituted  
129 heterocyclylalkoxy groups; or  $R^5$  may be absent if A is nitrogen;  
130 or  $R^8$  may be absent if D is nitrogen;

131  $R^6$  and  $R^7$  are independently selected from the group consisting  
132 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
133 alkyl groups having from 1 to 12 carbon atoms, substituted and  
134 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
135 substituted and unsubstituted heterocyclyl groups, substituted  
136 and unsubstituted heterocyclylalkyl groups, -SH, substituted and  
137 unsubstituted -S-alkyl groups, substituted and unsubstituted  
138 -S-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
139 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
140 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
141 unsubstituted alkoxy groups, substituted and unsubstituted  
142 heterocycloxy groups, substituted and unsubstituted  
143 heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
144 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
145 groups, substituted and unsubstituted -N(H)(heterocyclyl)  
146 groups, substituted and unsubstituted -N(alkyl)(heterocyclyl)

147 groups, substituted and unsubstituted -N(heterocyclyl)<sub>2</sub> groups,  
148 substituted and unsubstituted -N(H)(heterocyclylalkyl) groups,  
149 substituted and unsubstituted -N(alkyl)(heterocyclylalkyl) groups,  
150 substituted and unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups,  
151 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
152 substituted and unsubstituted -N(H)-C(=O)-heterocyclyl groups,  
153 substituted and unsubstituted -N(H)-C(=O)-heterocyclylalkyl  
154 groups, substituted and unsubstituted -C(=O)-alkyl groups,  
155 substituted and unsubstituted -C(=O)-heterocyclyl groups,  
156 substituted and unsubstituted -C(=O)-heterocyclylalkyl groups,  
157 -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)  
158 groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
159 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
160 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclyl)  
161 groups, substituted and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub>  
162 groups, substituted and unsubstituted  
163 -C(=O)-N(H)(heterocyclylalkyl) groups, substituted and  
164 unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl) groups,  
165 substituted and unsubstituted -C(=O)-N(heterocyclylalkyl)<sub>2</sub>  
166 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
167 groups, substituted and unsubstituted -C(=O)-O-heterocyclyl  
168 groups, and substituted and unsubstituted  
169 -C(=O)-O-heterocyclylalkyl groups; or R<sup>6</sup> is absent if B is  
170 nitrogen; or R<sup>7</sup> is absent if C is nitrogen;

171 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
172 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
173 substituted and unsubstituted alkenyl groups having from 1 to 12  
174 carbons, substituted and unsubstituted aryl groups, substituted  
175 and unsubstituted aralkyl groups, substituted and unsubstituted  
176 heterocyclyl groups, substituted and unsubstituted

177 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
178 alkoxy groups, and -NH<sub>2</sub>; and

179 R<sup>10</sup> is -H.

1 45. The method of claim 44, wherein

2 R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
4 from 1 to 12 carbon atoms, substituted and unsubstituted  
5 alkenyl groups having from 1 to 12 carbon atoms, substituted  
6 and unsubstituted heterocyclyl groups, substituted and  
7 unsubstituted heterocyclylalkyl groups, -OH, substituted and  
8 unsubstituted alkoxy groups, substituted and unsubstituted  
9 heterocyclyloxy groups, substituted and unsubstituted  
10 heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
11 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
12 groups, substituted and unsubstituted -N(H)(heterocyclyl)  
13 groups, substituted and unsubstituted -N(alkyl)(heterocyclyl)  
14 groups, substituted and unsubstituted -N(heterocyclyl)<sub>2</sub> groups,  
15 substituted and unsubstituted -N(H)(heterocyclylalkyl) groups,  
16 substituted and unsubstituted -N(alkyl)(heterocyclylalkyl) groups,  
17 and substituted and unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups;

18 R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting  
19 of -H, -F, -Cl, -Br, -I, -NO<sub>2</sub>, -CN, substituted and unsubstituted  
20 alkyl groups having from 1 to 12 carbon atoms, substituted and  
21 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
22 substituted and unsubstituted aryl groups, substituted and  
23 unsubstituted aralkyl groups, substituted and unsubstituted  
24 heterocyclyl groups, substituted and unsubstituted

25 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
26 alkoxy groups, substituted and unsubstituted aryloxy groups,  
27 substituted and unsubstituted heterocyclyloxy groups,  
28 substituted and unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>,  
29 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
30 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
31 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
32 -N(alkyl)(aryl) groups, substituted and unsubstituted -N(aryl)<sub>2</sub>  
33 groups, substituted and unsubstituted -N(H)(aralkyl) groups,  
34 substituted and unsubstituted -N(alkyl)(aralkyl) groups,  
35 substituted and unsubstituted -N(aralkyl)<sub>2</sub> groups, substituted  
36 and unsubstituted -N(H)(heterocyclyl) groups, substituted and  
37 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
38 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
39 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
40 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
41 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
42 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
43 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
44 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
45 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
46 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
47 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
48 unsubstituted -C(=O)-N(alkyl)(aryl) groups, substituted and  
49 unsubstituted -C(=O)-N(aryl)<sub>2</sub> groups, substituted and  
50 unsubstituted -C(=O)-N(H)(aralkyl) groups, substituted and  
51 unsubstituted -C(=O)-N(alkyl)(aralkyl) groups, substituted and  
52 unsubstituted -C(=O)-N(aralkyl)<sub>2</sub> groups, substituted and  
53 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
54 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
55 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
56 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,

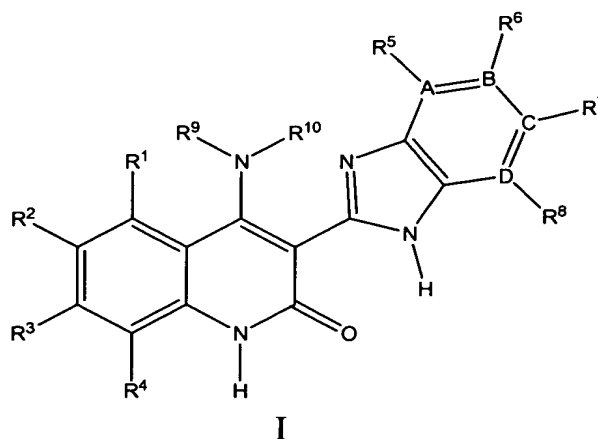


57 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl)  
58 groups, substituted and unsubstituted  
59 -C(=O)-N(heterocyclalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
60 unsubstituted -C(=O)-O-alkyl groups, substituted and  
61 unsubstituted -C(=O)-O-heterocycl groups, and substituted  
62 and unsubstituted -C(=O)-O-heterocyclalkyl groups;

63 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
64 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
65 alkyl groups having from 1 to 12 carbon atoms, substituted and  
66 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
67 substituted and unsubstituted heterocycl groups, substituted  
68 and unsubstituted heterocyclalkyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>,  
69 substituted and unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups,  
70 substituted and unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH,  
71 substituted and unsubstituted alkoxy groups, substituted and  
72 unsubstituted heterocycloxy groups, substituted and  
73 unsubstituted heterocyclalkoxy groups, -NH<sub>2</sub>, substituted and  
74 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
75 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
76 -N(H)(heterocycl) groups, substituted and unsubstituted  
77 -N(alkyl)(heterocycl) groups, substituted and unsubstituted  
78 -N(heterocycl)<sub>2</sub> groups, substituted and unsubstituted  
79 -N(H)(heterocyclalkyl) groups, substituted and unsubstituted  
80 -N(alkyl)(heterocyclalkyl) groups, substituted and unsubstituted  
81 -N(heterocyclalkyl)<sub>2</sub> groups, substituted and unsubstituted  
82 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
83 -N(H)-C(=O)-heterocycl groups, substituted and unsubstituted  
84 -N(H)-C(=O)-heterocyclalkyl groups, substituted and  
85 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
86 -C(=O)-heterocycl groups, substituted and unsubstituted  
87 -C(=O)-heterocyclalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and

88 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
 89 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
 90 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
 91 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
 92 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
 93 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,  
 94 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl)  
 95 groups, substituted and unsubstituted  
 96 -C(=O)-N(heterocyclylalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
 97 unsubstituted -C(=O)-O-alkyl groups, substituted and  
 98 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
 99 and unsubstituted -C(=O)-O-heterocyclylalkyl groups; or R<sup>6</sup> is  
 100 absent if B is nitrogen; or R<sup>7</sup> is absent if C is nitrogen.

1 46. A method of inhibiting a tyrosine kinase in a subject or  
 2 treating a biological condition mediated by the tyrosine kinase in a subject,  
 3 comprising: administering to the subject a compound of Structure I, a  
 4 tautomer of the compound, a pharmaceutically acceptable salt of the  
 5 compound, a pharmaceutically acceptable salt of the tautomer, or mixtures  
 6 thereof wherein the tyrosine kinase is the Fyn oncogene kinase related to  
 7 SRC, FGR, YES and Structure I has the following formula



8

9

wherein,

10 A, B, C, and D are independently selected from the group  
11 consisting of carbon and nitrogen;

12  $R^1$  and  $R^3$  are independently selected from the group consisting  
13 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, and substituted and  
14 unsubstituted straight and branched chain alkyl groups having  
15 from 1 to 8 carbon atoms;

16  $R^2$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
17 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
18 from 1 to 12 carbon atoms, substituted and unsubstituted aryl  
19 groups, and substituted and unsubstituted aralkyl groups;

20  $R^4$  is selected from the group consisting of -H and substituted  
21 and unsubstituted straight and branched chain alkyl groups  
22 having from 1 to 8 carbon atoms;

23  $R^5$  and  $R^8$  are independently selected from the group consisting  
24 of -H and substituted and unsubstituted straight and branched  
25 chain alkyl groups having from 1 to 8 carbon atoms; or  $R^5$  may  
26 be absent if A is nitrogen; or  $R^8$  may be absent if D is nitrogen;

27  $R^6$  and  $R^7$  are independently selected from the group consisting  
28 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
29 alkyl groups having from 1 to 12 carbon atoms, substituted and  
30 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
31 substituted and unsubstituted heterocyclyl groups, substituted  
32 and unsubstituted heterocyclylalkyl groups, -SH, substituted and  
33 unsubstituted -S-alkyl groups, -OH, substituted and  
34 unsubstituted alkoxy groups, substituted and unsubstituted  
35 heterocycloxy groups, substituted and unsubstituted

36 heterocyclalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
37 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
38 groups, substituted and unsubstituted -N(H)(heterocycl)  
39 groups, substituted and unsubstituted -N(alkyl)(heterocycl)  
40 groups, substituted and unsubstituted -N(heterocycl)<sub>2</sub> groups,  
41 substituted and unsubstituted -N(H)(heterocyclalkyl) groups,  
42 substituted and unsubstituted -N(alkyl)(heterocyclalkyl) groups,  
43 substituted and unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups,  
44 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
45 substituted and unsubstituted -N(H)-C(=O)-heterocycl groups,  
46 substituted and unsubstituted -N(H)-C(=O)-heterocyclalkyl,  
47 substituted and unsubstituted -N(alkyl)-C(=O)-alkyl groups,  
48 substituted and unsubstituted -N(alkyl)-C(=O)-heterocycl  
49 groups, substituted and unsubstituted  
50 -N(alkyl)-C(=O)-heterocyclalkyl, substituted and unsubstituted  
51 -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
52 -N(H)-S(=O)<sub>2</sub>-heterocycl groups, substituted and unsubstituted  
53 -N(H)-S(=O)<sub>2</sub>-heterocyclalkyl groups, substituted and  
54 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
55 -C(=O)-heterocycl groups, substituted and unsubstituted  
56 -C(=O)-heterocyclalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
57 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
58 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
59 unsubstituted -C(=O)-N(H)(heterocycl) groups, substituted and  
60 unsubstituted -C(=O)-N(alkyl)(heterocycl) groups, substituted  
61 and unsubstituted -C(=O)-N(H)(heterocyclalkyl) groups,  
62 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl)  
63 groups, -CO<sub>2</sub>H, substituted and unsubstituted -C(=O)-O-alkyl  
64 groups, substituted and unsubstituted -C(=O)-O-heterocycl  
65 groups, and substituted and unsubstituted  
66 -C(=O)-O-heterocyclalkyl groups; or R<sup>6</sup> may be absent if B is  
67 nitrogen; or R<sup>7</sup> may be absent if C is nitrogen;

68 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
69 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
70 substituted and unsubstituted alkenyl groups having from 1 to 12  
71 carbon atoms, substituted and unsubstituted heterocyclyl  
72 groups, substituted and unsubstituted heterocyclylalkyl groups,  
73 substituted and unsubstituted alkoxy groups, substituted and  
74 unsubstituted heterocyclyoxy groups, and substituted and  
75 unsubstituted heterocyclylalkoxy; and

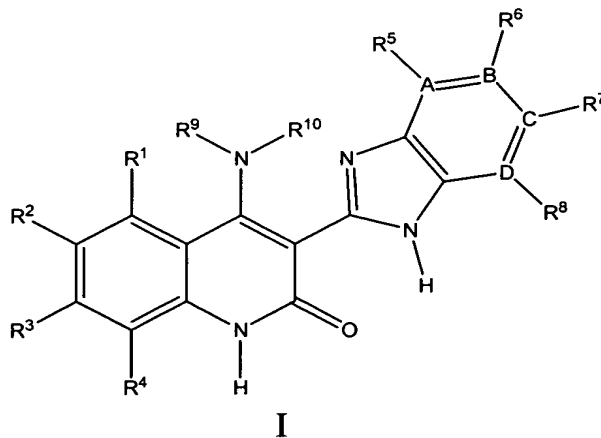
76 R<sup>10</sup> is -H.

1 47. The method of claim 46, wherein

2 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
3 of -H, -F, -Cl, -Br, -I, substituted and unsubstituted alkyl groups  
4 having from 1 to 8 carbon atoms, substituted and unsubstituted  
5 heterocyclyl groups, substituted and unsubstituted  
6 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
7 alkoxy groups, substituted and unsubstituted heterocyclyoxy,  
8 substituted and unsubstituted heterocyclylalkoxy, -NH<sub>2</sub>,  
9 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
10 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
11 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
12 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
13 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
14 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
15 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
16 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
17 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
18 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
19 unsubstituted -N(H)-C(=O)-heterocyclylalkyl, substituted and

unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted and unsubstituted -N(alkyl)-C(=O)-heterocyclylalkyl, -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups, and substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl) groups; or R<sup>6</sup> may be absent if B is nitrogen; or R<sup>7</sup> may be absent if C is nitrogen.

48. A method of inhibiting a tyrosine kinase in a subject or treating a biological condition mediated by the tyrosine kinase in a subject, comprising: administering to the subject a compound of Structure I, a tautomer of the compound, a pharmaceutically acceptable salt of the compound, a pharmaceutically acceptable salt of the tautomer, or mixtures thereof wherein the tyrosine kinase is Lck and Structure I has the following formula



wherein,

10 A, B, C, and D are independently selected from the group  
11 consisting of carbon and nitrogen;

12  $R^1$ ,  $R^2$ , and  $R^3$  are independently selected from the group  
13 consisting of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, and substituted and  
14 unsubstituted straight and branched chain alkyl groups having  
15 from 1 to 8 carbon atoms;

16  $R^4$  is selected from the group consisting of -H and substituted  
17 and unsubstituted straight and branched chain alkyl groups  
18 having from 1 to 8 carbon atoms;

19  $R^5$  and  $R^8$  are independently selected from the group consisting  
20 of -H and substituted and unsubstituted straight and branched  
21 chain alkyl groups having from 1 to 8 carbon atoms; or  $R^5$  may  
22 be absent if A is nitrogen; or  $R^8$  may be absent if D is nitrogen;

23  $R^6$  and  $R^7$  are independently selected from the group consisting  
24 of -H, -F, -Cl, -Br, -I, -CN, -NO<sub>2</sub>, substituted and unsubstituted  
25 alkyl groups having from 1 to 12 carbon atoms, substituted and  
26 unsubstituted alkenyl groups having from 1 to 12 carbon atoms,  
27 substituted and unsubstituted heterocyclyl groups, substituted  
28 and unsubstituted heterocyclylalkyl groups, -SH, substituted and  
29 unsubstituted -S-alkyl groups, -OH, substituted and  
30 unsubstituted alkoxy groups, substituted and unsubstituted  
31 heterocycloxy groups, substituted and unsubstituted  
32 heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
33 -N(H)(alkyl) groups, substituted and unsubstituted -N(alkyl)<sub>2</sub>  
34 groups, substituted and unsubstituted -N(H)(heterocyclyl)  
35 groups, substituted and unsubstituted -N(alkyl)(heterocyclyl)  
36 groups, substituted and unsubstituted -N(heterocyclyl)<sub>2</sub> groups,

37 substituted and unsubstituted -N(H)(heterocyclalkyl) groups,  
38 substituted and unsubstituted -N(alkyl)(heterocyclalkyl) groups,  
39 substituted and unsubstituted -N(heterocyclalkyl)<sub>2</sub> groups,  
40 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
41 substituted and unsubstituted -N(H)-C(=O)-heterocycl groups,  
42 substituted and unsubstituted -N(H)-C(=O)-heterocyclalkyl,  
43 substituted and unsubstituted -N(alkyl)-C(=O)-alkyl groups,  
44 substituted and unsubstituted -N(alkyl)-C(=O)-heterocycl  
45 groups, substituted and unsubstituted  
46 -N(alkyl)-C(=O)-heterocyclalkyl, substituted and unsubstituted  
47 -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
48 -N(H)-S(=O)<sub>2</sub>-heterocycl groups, substituted and unsubstituted  
49 -N(H)-S(=O)<sub>2</sub>-heterocyclalkyl groups, substituted and  
50 unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-alkyl groups, substituted and  
51 unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocycl groups, substituted  
52 and unsubstituted -N(alkyl)-S(=O)<sub>2</sub>-heterocyclalkyl groups,  
53 substituted and unsubstituted -C(=O)-alkyl groups, substituted  
54 and unsubstituted -C(=O)-heterocycl groups, substituted and  
55 unsubstituted -C(=O)-heterocyclalkyl groups, -C(=O)-NH<sub>2</sub>,  
56 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
57 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
58 substituted and unsubstituted -C(=O)-N(H)(heterocycl) groups,  
59 substituted and unsubstituted -C(=O)-N(alkyl)(heterocycl)  
60 groups, substituted and unsubstituted  
61 -C(=O)-N(H)(heterocyclalkyl) groups, substituted and  
62 unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl) groups, -CO<sub>2</sub>H,  
63 substituted and unsubstituted -C(=O)-O-alkyl groups, substituted  
64 and unsubstituted -C(=O)-O-heterocycl groups, and  
65 substituted and unsubstituted -C(=O)-O-heterocyclalkyl  
66 groups; or R<sup>6</sup> may be absent if B is nitrogen; or R<sup>7</sup> may be  
67 absent if C is nitrogen;



68 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
69 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
70 substituted and unsubstituted alkenyl groups having from 1 to 12  
71 carbon atoms, substituted and unsubstituted heterocyclyl  
72 groups, substituted and unsubstituted heterocyclylalkyl groups,  
73 substituted and unsubstituted alkoxy groups, and substituted  
74 and unsubstituted heterocycloxy groups; and

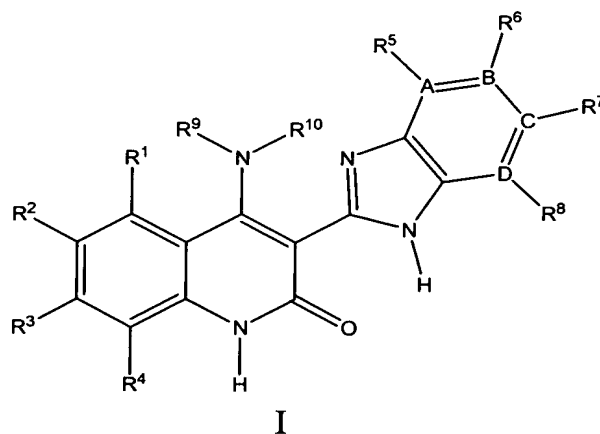
75 R<sup>10</sup> is -H.

1 49. The method of claim 48, wherein

2 R<sup>6</sup> and R<sup>7</sup> are independently selected from the group consisting  
3 of -H, -F, -Cl, -Br, -I, substituted and unsubstituted alkyl groups  
4 having from 1 to 8 carbon atoms, substituted and unsubstituted  
5 heterocyclyl groups, substituted and unsubstituted  
6 heterocyclylalkyl groups, -OH, substituted and unsubstituted  
7 alkoxy groups, substituted and unsubstituted heterocycloxy,  
8 substituted and unsubstituted heterocyclylalkoxy, -NH<sub>2</sub>,  
9 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
10 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
11 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
12 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
13 unsubstituted -N(heterocyclyl)<sub>2</sub> groups, substituted and  
14 unsubstituted -N(H)(heterocyclylalkyl) groups, substituted and  
15 unsubstituted -N(alkyl)(heterocyclylalkyl) groups, substituted and  
16 unsubstituted -N(heterocyclylalkyl)<sub>2</sub> groups, substituted and  
17 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
18 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
19 unsubstituted -N(H)-C(=O)-heterocyclylalkyl, substituted and  
20 unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and

21 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
22 and unsubstituted -N(alkyl)-C(=O)-heterocyclalkyl,  
23 -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)  
24 groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
25 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
26 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclyl)  
27 groups, substituted and unsubstituted  
28 -C(=O)-N(H)(heterocyclalkyl) groups, and substituted and  
29 unsubstituted -C(=O)-N(alkyl)(heterocyclalkyl) groups; or R<sup>6</sup>  
30 may be absent if B is nitrogen; or R<sup>7</sup> may be absent if C is  
31 nitrogen.

1 50. A method of inhibiting a tyrosine kinase in a subject or  
2 treating a biological condition mediated by the tyrosine kinase in a subject,  
3 comprising: administering to the subject a compound of Structure I, a  
4 tautomer of the compound, a pharmaceutically acceptable salt of the  
5 compound, a pharmaceutically acceptable salt of the tautomer, or mixtures  
6 thereof wherein the tyrosine kinase is Tie-2 and Structure I has the following  
7 formula



8  
9 wherein,

10 A, B, C, and D are independently selected from the group  
11 consisting of carbon and nitrogen;

12  $R^1$  is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
13 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
14 from 1 to 12 carbon atoms, substituted and unsubstituted  
15 alkenyl groups having from 1 to 12 carbon atoms, substituted  
16 and unsubstituted aryl groups, substituted and unsubstituted  
17 aralkyl groups, substituted and unsubstituted heterocyclyl  
18 groups, substituted and unsubstituted heterocyclylalkyl groups,  
19 -SH, substituted and unsubstituted -S-alkyl groups, -OH,  
20 substituted and unsubstituted alkoxy groups, substituted and  
21 unsubstituted heterocyclyoxy groups, substituted and  
22 unsubstituted heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and  
23 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
24 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
25 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
26 -N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
27 -N(alkyl)(heterocyclylalkyl) groups, substituted and unsubstituted  
28 -N(heterocyclyl)<sub>2</sub> groups, substituted and unsubstituted  
29 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
30 -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
31 -C(=O)-alkyl groups, substituted and unsubstituted  
32 -C(=O)-heterocyclylalkyl groups, -C(=O)-NH<sub>2</sub>, substituted and  
33 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
34 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
35 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
36 unsubstituted -C(=O)-N(alkyl)(heterocyclyl) groups, substituted  
37 and unsubstituted -C(=O)-N(heterocyclyl)<sub>2</sub> groups, substituted  
38 and unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups,  
39 substituted and unsubstituted -C(=O)-N(alkyl)(heterocyclylalkyl)  
40 groups, substituted and unsubstituted  
41 -C(=O)-N(heterocyclylalkyl)<sub>2</sub> groups, -CO<sub>2</sub>H, substituted and  
42 unsubstituted -C(=O)-O-alkyl groups, substituted and

43 unsubstituted -C(=O)-O-heterocyclyl groups, and substituted  
44 and unsubstituted -C(=O)-O-heterocyclylalkyl groups;

45 R<sup>2</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
46 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
47 from 1 to 12 carbon atoms, substituted and unsubstituted  
48 alkenyl groups having from 1 to 12 carbon atoms, substituted  
49 and unsubstituted aryl groups, substituted and unsubstituted  
50 aralkyl groups, substituted and unsubstituted heterocyclyl  
51 groups, substituted and unsubstituted heterocyclylalkyl groups,  
52 -OH, substituted and unsubstituted alkoxy groups, substituted  
53 and unsubstituted heterocyclyloxy groups, substituted and  
54 unsubstituted heterocyclylalkoxy groups, -SH, substituted and  
55 unsubstituted -S-alkyl groups, -CO<sub>2</sub>H, -C(=O)-NH<sub>2</sub>, substituted  
56 and unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
57 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
58 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
59 unsubstituted -C(=O)-N(H)(heterocyclylalkyl) groups, substituted  
60 and unsubstituted -C(=O)-O-alkyl groups, substituted and  
61 unsubstituted -C(=O)-O-heterocyclyl groups, substituted and  
62 unsubstituted -C(=O)-O-heterocyclylalkyl groups, substituted  
63 and unsubstituted -C(=O)-alkyl groups, substituted and  
64 unsubstituted -C(=O)-heterocyclylalkyl groups, -NH<sub>2</sub>, substituted  
65 and unsubstituted -N(H)(alkyl) groups, substituted and  
66 unsubstituted -N(H)(aryl) groups, substituted and unsubstituted  
67 -N(H)(heterocyclyl) groups, substituted and unsubstituted  
68 -N(alkyl)(heterocyclyl) groups, substituted and unsubstituted  
69 -N(alkyl)(heterocyclylalkyl) groups, substituted and unsubstituted  
70 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
71 -N(heterocyclyl)<sub>2</sub> groups, substituted and unsubstituted  
72 -N(H)-C(=O)-alkyl groups, and substituted and unsubstituted

- 73 -N(H)-S(=O)-alkyl groups; or R<sup>2</sup> and R<sup>3</sup> may join together to form  
74 a cyclic group;
- 75 R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting  
76 of -H and substituted and unsubstituted straight and branched  
77 chain alkyl groups having from 1 to 8 carbon atoms;
- 78 R<sup>5</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
79 and substituted and unsubstituted straight and branched chain  
80 alkyl groups having from 1 to 8 carbon atoms; or R<sup>5</sup> may be  
81 absent if A is nitrogen;
- 82 R<sup>6</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
83 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
84 from 1 to 12 carbon atoms, substituted and unsubstituted  
85 alkenyl groups having from 1 to 12 carbon atoms, substituted  
86 and unsubstituted aryl groups, substituted and unsubstituted  
87 aralkyl groups, substituted and unsubstituted heterocyclyl  
88 groups, substituted and unsubstituted heterocyclylalkyl groups,  
89 -SH, substituted and unsubstituted -S-alkyl groups, substituted  
90 and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and  
91 unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and  
92 unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
93 unsubstituted -S(=O)-alkyl groups, substituted and unsubstituted  
94 -S(=O)-heterocyclyl groups, -S(=O)<sub>2</sub>-NH<sub>2</sub>, substituted and  
95 unsubstituted -S(=O)<sub>2</sub>-N(H)(alkyl) groups, substituted and  
96 unsubstituted -S(=O)<sub>2</sub>-N(alkyl)<sub>2</sub> groups, -OH, substituted and  
97 unsubstituted alkoxy groups, substituted and unsubstituted  
98 heterocycloxy groups, substituted and unsubstituted  
99 heterocyclylalkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
100 -N(H)(alkyl) groups, substituted and unsubstituted -N(H)(aryl)

101 groups, substituted and unsubstituted -N(H)(heterocyclyl)  
102 groups, substituted and unsubstituted -N(alkyl)(heterocyclyl)  
103 groups, substituted and unsubstituted -N(alkyl)(heterocyclylalkyl)  
104 groups, substituted and unsubstituted -N(alkyl)<sub>2</sub> groups,  
105 substituted and unsubstituted -N(heterocyclyl)<sub>2</sub> groups,  
106 substituted and unsubstituted -N(H)-C(=O)-alkyl groups,  
107 substituted and unsubstituted -N(H)-C(=O)-heterocyclyl groups,  
108 substituted and unsubstituted -N(alkyl)-C(=O)-alkyl groups,  
109 substituted and unsubstituted -N(alkyl)-C(=O)-heterocyclyl  
110 groups, substituted and unsubstituted -N(H)-S(=O)-alkyl groups,  
111 substituted and unsubstituted -N(H)-S(=O)-heterocyclyl groups,  
112 substituted and unsubstituted -N(alkyl)-S(=O)-alkyl groups, and  
113 substituted and unsubstituted -N(alkyl)-S(=O)-heterocyclyl  
114 groups, substituted and unsubstituted -C(=O)-alkyl groups,  
115 substituted and unsubstituted -C(=O)-heterocyclylalkyl groups  
116 -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)  
117 groups, substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
118 substituted and unsubstituted -C(=O)-N(H)(heterocyclyl) groups,  
119 -C(=O)-N(H)(heterocyclylalkyl) groups, -CO<sub>2</sub>H, substituted and  
120 unsubstituted -C(=O)-O-alkyl groups, substituted and  
121 unsubstituted -C(=O)-O-heterocyclyl groups, substituted and  
122 unsubstituted -C(=O)-O-heterocyclylalkyl groups; or R<sup>6</sup> may be  
123 absent if B is nitrogen;

124 R<sup>7</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
125 -CN, -NO<sub>2</sub>, substituted and unsubstituted alkyl groups having  
126 from 1 to 12 carbon atoms, substituted and unsubstituted  
127 alkenyl groups having from 1 to 12 carbon atoms, substituted  
128 and unsubstituted aryl groups, substituted and unsubstituted  
129 aralkyl groups, substituted and unsubstituted heterocyclyl  
130 groups, substituted and unsubstituted heterocyclylalkyl groups,  
131 -SH, substituted and unsubstituted -S-alkyl groups, -OH,

132 substituted and unsubstituted alkoxy groups, substituted and  
133 unsubstituted heterocycloxy groups, substituted and  
134 unsubstituted heterocyclalkoxy groups, -NH<sub>2</sub>, substituted and  
135 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
136 -N(H)(aryl) groups, substituted and unsubstituted  
137 -N(H)(heterocycl) groups, substituted and unsubstituted  
138 -N(alkyl)(heterocycl) groups, substituted and unsubstituted  
139 -N(alkyl)(heterocyclalkyl) groups, substituted and unsubstituted  
140 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
141 -N(heterocycl)<sub>2</sub> groups, substituted and unsubstituted  
142 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
143 -N(H)-S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
144 -C(=O)-alkyl groups, substituted and unsubstituted  
145 -C(=O)-heterocyclalkyl groups -C(=O)-NH<sub>2</sub>, substituted and  
146 unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
147 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
148 unsubstituted -C(=O)-N(H)(heterocycl) groups,  
149 -C(=O)-N(H)(heterocyclalkyl) groups, -CO<sub>2</sub>H, substituted and  
150 unsubstituted -C(=O)-O-alkyl groups, substituted and  
151 unsubstituted -C(=O)-O-heterocycl groups, and substituted  
152 and unsubstituted -C(=O)-O-heterocyclalkyl groups; or R<sup>7</sup> may  
153 be absent if C is nitrogen;

154 R<sup>8</sup> is selected from the group consisting of -H, substituted and  
155 unsubstituted alkyl groups having from 1 to 12 carbon atoms; or  
156 R<sup>8</sup> may be absent if D is nitrogen;

157 R<sup>9</sup> is selected from the group consisting of -H, substituted and  
158 unsubstituted alkyl groups having from 1 to 12 carbon atoms,  
159 substituted and unsubstituted alkenyl groups having from 1 to 12  
160 carbon atoms, substituted and unsubstituted aryl groups,

161 substituted and unsubstituted aralkyl groups, substituted and  
162 unsubstituted heterocyclyl groups, substituted and unsubstituted  
163 heterocyclylalkyl groups, substituted and unsubstituted alkoxy  
164 groups, substituted and unsubstituted heterocycloxy groups,  
165 -NH<sub>2</sub>, and substituted and unsubstituted heterocyclaminoalkyl;  
166 or R<sup>9</sup> and R<sup>10</sup> join together to form a ring having 5, 6, or 7 ring  
167 members; and

168 R<sup>10</sup> is -H.

1 51. The method of claim 50, wherein

2 R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 substituted and unsubstituted alkyl groups having from 1 to 12  
4 carbon atoms, substituted and unsubstituted heterocyclyl  
5 groups, substituted and unsubstituted heterocyclalkyl groups,  
6 -OH, substituted and unsubstituted alkoxy groups, substituted  
7 and unsubstituted heterocycloxy groups, and substituted and  
8 unsubstituted heterocyclalkoxy groups;

9 R<sup>2</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
10 substituted and unsubstituted alkyl groups having from 1 to 12  
11 carbon atoms, substituted and unsubstituted cycloalkenyl  
12 groups, substituted and unsubstituted aryl groups, substituted  
13 and unsubstituted heterocyclyl groups, -OH, substituted and  
14 unsubstituted alkoxy groups, substituted and unsubstituted  
15 heterocycloxy groups, substituted and unsubstituted  
16 heterocyclalkoxy groups;

17 R<sup>6</sup> is selected from the group consisting of -H, substituted and  
18 unsubstituted alkyl groups having from 1 to 8 carbon atoms,



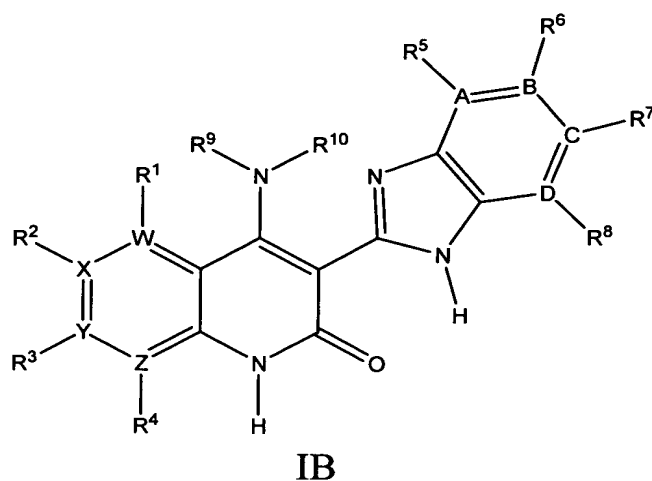
19 substituted and unsubstituted heterocyclyl groups, -OH,  
20 substituted and unsubstituted alkoxy groups, substituted and  
21 unsubstituted heterocycloxy, substituted and unsubstituted  
22 heterocyclalkoxy, substituted and unsubstituted -N(H)(alkyl)  
23 groups, substituted and unsubstituted -N(H)(heterocyclyl)  
24 groups, and substituted and unsubstituted -N(alkyl)(heterocyclyl)  
25 groups; or R<sup>6</sup> may be absent if B is nitrogen;

26 R<sup>7</sup> is selected from the group consisting of -H, -Cl, -F, -Br,  
27 substituted and unsubstituted alkyl groups having from 1 to 8  
28 carbon atoms, -OH, substituted and unsubstituted alkoxy  
29 groups, substituted and unsubstituted heterocyclyl groups,  
30 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
31 and unsubstituted -N(H)(heterocyclyl) groups, and substituted  
32 and unsubstituted -N(alkyl)(heterocyclyl) groups,; or R<sup>7</sup> may be  
33 absent if C is nitrogen.

1 52. The method of any of claims 44, 46, 48, or 50, wherein  
2 the IC<sub>50</sub> value of the compound is less than or equal to 0.1 μM with respect to  
3 the tyrosine kinase.

1 53. The method of any of claims 46 or 48, wherein the  
2 biological condition is an autoimmune disease.

1 54. A method of inhibiting a serine/threonine kinase in a  
2 subject or treating a condition mediated by a serine/threonine kinase in a  
3 subject, comprising: administering to the subject a compound of Structure IB,  
4 a tautomer of the compound, a pharmaceutically acceptable salt of the  
5 compound, a pharmaceutically acceptable salt of the tautomer, or mixtures  
6 thereof wherein Structure IB has the following formula



wherein,

A, B, C, and D are independently selected from the group consisting of carbon and nitrogen;

W, X, Y, and Z are independently selected from the group consisting of carbon and nitrogen and at least one of W, X, Y, and Z is a nitrogen;

R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I, substituted and unsubstituted straight and branched chain alkyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted alkenyl groups having from 1 to 8 carbon atoms, substituted and unsubstituted alkynyl groups having from 1 to 8 carbon atoms, -CN, -NO<sub>2</sub>, -OH, -SH, substituted and unsubstituted alkoxy groups, substituted and unsubstituted -S-alkyl groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups, substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted -S(=O)-alkyl groups, -S(=O)-NH<sub>2</sub>, substituted and unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -C(=O)-NH<sub>2</sub>, substituted and unsubstituted -C(=O)-N(H)(alkyl)

27 groups, substituted and unsubstituted  $\text{-C(=O)-N(alkyl)}_2$  groups,  
28 substituted and unsubstituted  $\text{-C(=O)-O-alkyl}$  groups,  $\text{-NH}_2$ ,  
29 substituted and unsubstituted  $\text{-N(H)(alkyl)}$  groups, substituted  
30 and unsubstituted  $\text{-N(alkyl)}_2$  groups, substituted and  
31 unsubstituted  $\text{-N(H)-C(=O)-alkyl}$  groups, and substituted and  
32 unsubstituted  $\text{-N(H)-S(=O)-alkyl}$  groups; or  $\text{R}^1$  may be absent if  
33 W is nitrogen;

34  $\text{R}^2$  is selected from the group consisting of  $\text{-H}$ ,  $\text{-F}$ ,  $\text{-Cl}$ ,  $\text{-Br}$ ,  $\text{-I}$ ,  
35  $\text{-NO}_2$ ,  $\text{-CN}$ ,  $\text{-NH}_2$ ,  $\text{-CO}_2\text{H}$ ,  $\text{-OH}$ , substituted and unsubstituted  
36 straight and branched chain alkyl groups having from 1 to 8  
37 carbon atoms, substituted and unsubstituted cycloalkenyl  
38 groups, substituted and unsubstituted cycloalkyl groups,  
39 substituted and unsubstituted alkoxy groups, substituted and  
40 unsubstituted  $\text{-N(H)(alkyl)}$  groups, substituted and unsubstituted  
41  $\text{-N(alkyl)}_2$  groups, substituted and unsubstituted heterocyclyl  
42 groups, substituted and unsubstituted aryl groups, substituted  
43 and unsubstituted alkenyl groups having from 1 to 8 carbon  
44 atoms, substituted and unsubstituted alkynyl groups having from  
45 1 to 8 carbon atoms,  $\text{-SH}$ , substituted and unsubstituted  $\text{-S-alkyl}$   
46 groups, substituted and unsubstituted  $\text{-S(=O)}_2\text{-O-alkyl}$  groups,  
47 substituted and unsubstituted  $\text{-S(=O)}_2\text{-alkyl}$  groups, substituted  
48 and unsubstituted  $\text{-S(=O)}_2\text{-heterocyclyl}$  groups, substituted and  
49 unsubstituted  $\text{-S(=O)-alkyl}$  groups, substituted and unsubstituted  
50  $\text{-S(=O)-heterocyclyl}$  groups,  $\text{-S(=O)-NH}_2$ , substituted and  
51 unsubstituted  $\text{-S(=O)-N(H)(alkyl)}$  groups, substituted and  
52 unsubstituted  $\text{-S(=O)-N(alkyl)}_2$  groups,  $\text{-C(=O)-NH}_2$ , substituted  
53 and unsubstituted  $\text{-C(=O)-N(H)(alkyl)}$  groups, substituted and  
54 unsubstituted  $\text{-C(=O)-N(alkyl)}_2$  groups, substituted and  
55 unsubstituted  $\text{-C(=O)-alkyl}$  groups, substituted and unsubstituted  
56  $\text{-C(=O)-heterocyclyl}$  groups, substituted and unsubstituted  
57  $\text{-C(=O)-O-alkyl}$  groups, substituted and unsubstituted

58 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
59 -N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted  
60 -N(H)-S(=O)-alkyl groups, substituted and unsubstituted  
61 -N(H)-S(=O)-heterocyclyl groups, -N(alkyl)-C(=O)-alkyl groups,  
62 substituted and unsubstituted -N(alkyl)-C(=O)-heterocyclyl  
63 groups, substituted and unsubstituted -N(alkyl)-S(=O)-alkyl  
64 groups, substituted and unsubstituted  
65 -N(alkyl)-S(=O)-heterocyclyl groups, -N(H)-C(=O)-NH<sub>2</sub>,  
66 substituted and unsubstituted -N(H)-C(=O)-N(H)(alkyl) groups,  
67 substituted and unsubstituted -N(H)-C(=O)-N(alkyl)<sub>2</sub> groups,  
68 -N(alkyl)-C(=O)-NH<sub>2</sub>, substituted and unsubstituted  
69 -N(alkyl)-C(=O)-N(H)(alkyl) groups, and substituted and  
70 unsubstituted -N(alkyl)-C(=O)-N(alkyl)<sub>2</sub> groups; or R<sup>2</sup> and R<sup>3</sup>  
71 may join together to form a cyclic group when X and Y are both  
72 carbon; or R<sup>2</sup> may be absent if X is nitrogen;

73 R<sup>3</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
74 -OH, substituted and unsubstituted straight and branched chain  
75 alkyl groups having from 1 to 8 carbon atoms, substituted and  
76 unsubstituted alkoxy groups, -CO<sub>2</sub>H, -CN, substituted and  
77 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
78 -N(H)(cycloalkyl) groups, substituted and unsubstituted  
79 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted heterocyclyl  
80 groups, substituted and unsubstituted aryl groups, substituted  
81 and unsubstituted -C(=O)-heterocyclyl groups, substituted and  
82 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
83 -C(=O)-N(H)(alkyl) groups, substituted and unsubstituted  
84 -C(=O)-N(alkyl)<sub>2</sub> groups, -C(=O)-NH<sub>2</sub> groups, substituted and  
85 unsubstituted -C(=O)-N(H)(heterocyclyl) groups, substituted and  
86 unsubstituted -C(=O)-N(H)(aryl) groups, substituted and  
87 unsubstituted alkenyl groups having from 1 to 8 carbon atoms,  
88 substituted and unsubstituted alkynyl groups having from 1 to 8

89 carbon atoms, -NO<sub>2</sub>, -SH, substituted and unsubstituted -S-alkyl  
90 groups, substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups,  
91 substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted  
92 and unsubstituted -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and  
93 unsubstituted -S(=O)-alkyl groups, substituted and unsubstituted  
94 -S(=O)-heterocyclyl groups, -S(=O)-NH<sub>2</sub>, substituted and  
95 unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and  
96 unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
97 unsubstituted -C(=O)-O-alkyl groups, -NH<sub>2</sub>, substituted and  
98 unsubstituted -N(H)-C(=O)-alkyl groups, substituted and  
99 unsubstituted -N(H)-C(=O)-heterocyclyl groups, substituted and  
100 unsubstituted -N(H)-S(=O)-alkyl groups, substituted and  
101 unsubstituted -N(H)-S(=O)-heterocyclyl groups, substituted and  
102 unsubstituted -N(alkyl)-C(=O)-alkyl groups, substituted and  
103 unsubstituted -N(alkyl)-C(=O)-heterocyclyl groups, substituted  
104 and unsubstituted -N(alkyl)-S(=O)-alkyl groups, substituted and  
105 unsubstituted -N(alkyl)-S(=O)-heterocyclyl groups,  
106 -N(H)-C(=O)-NH<sub>2</sub>, substituted and unsubstituted  
107 -N(H)-C(=O)-N(H)(alkyl) groups, substituted and unsubstituted  
108 -N(H)-C(=O)-N(alkyl)<sub>2</sub> groups, -N(alkyl)-C(=O)-NH<sub>2</sub>, substituted  
109 and unsubstituted -N(alkyl)-C(=O)-N(H)(alkyl) groups, and  
110 substituted and unsubstituted -N(alkyl)-C(=O)-N(alkyl)<sub>2</sub> groups;  
111 or R<sup>2</sup> and R<sup>3</sup> may join together to form a cyclic group when X  
112 and Y are both carbon; or R<sup>3</sup> may be absent if Y is nitrogen;

113 R<sup>4</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
114 substituted and unsubstituted straight and branched chain alkyl  
115 groups having from 1 to 8 carbon atoms, substituted and  
116 unsubstituted alkenyl groups having from 1 to 8 carbon atoms,  
117 substituted and unsubstituted alkynyl groups having from 1 to 8  
118 carbon atoms, -CN, -NO<sub>2</sub>, -OH, -SH, substituted and  
119 unsubstituted alkoxy groups, substituted and unsubstituted -S-

120 alkyl groups, substituted and unsubstituted  $-S(=O)_2-O$ -alkyl  
121 groups, substituted and unsubstituted  $-S(=O)_2$ -alkyl groups,  
122 substituted and unsubstituted  $-S(=O)$ -alkyl groups,  $-S(=O)-NH_2$ ,  
123 substituted and unsubstituted  $-S(=O)-N(H)(alkyl)$  groups,  
124 substituted and unsubstituted  $-S(=O)-N(alkyl)_2$  groups,  
125  $-C(=O)-NH_2$ , substituted and unsubstituted  $-C(=O)-N(H)(alkyl)$   
126 groups, substituted and unsubstituted  $-C(=O)-N(alkyl)_2$  groups,  
127 substituted and unsubstituted  $-C(=O)-O$ -alkyl groups,  $-NH_2$ ,  
128 substituted and unsubstituted  $-N(H)(alkyl)$  groups, substituted  
129 and unsubstituted  $-N(alkyl)_2$  groups, substituted and  
130 unsubstituted  $-N(H)-C(=O)$ -alkyl groups, and substituted and  
131 unsubstituted  $-N(H)-S(=O)$ -alkyl groups; or  $R^4$  may be absent if  
132 Z is nitrogen

133  $R^5$  is selected from the group consisting of  $-H$ ,  $-F$ ,  $-Cl$ ,  $-Br$ ,  $-I$ ,  
134 substituted and unsubstituted straight and branched chain alkyl  
135 groups having from 1 to 8 carbon atoms, substituted and  
136 unsubstituted heterocyclyl groups, substituted and unsubstituted  
137 alkenyl groups having from 1 to 8 carbon atoms, substituted and  
138 unsubstituted alkynyl groups having from 1 to 8 carbon atoms,  
139  $-CN$ ,  $-NO_2$ ,  $-OH$ ,  $-SH$ , substituted and unsubstituted alkoxy  
140 groups, substituted and unsubstituted  $-S$ -alkyl groups,  
141 substituted and unsubstituted  $-S(=O)_2-O$ -alkyl groups,  
142 substituted and unsubstituted  $-S(=O)_2$ -alkyl groups, substituted  
143 and unsubstituted  $-S(=O)$ -alkyl groups,  $-S(=O)-NH_2$ , substituted  
144 and unsubstituted  $-S(=O)-N(H)(alkyl)$  groups, substituted and  
145 unsubstituted  $-S(=O)-N(alkyl)_2$  groups,  $-C(=O)-NH_2$ , substituted  
146 and unsubstituted  $-C(=O)-N(H)(alkyl)$  groups, substituted and  
147 unsubstituted  $-C(=O)-N(alkyl)_2$  groups, substituted and  
148 unsubstituted  $-C(=O)-O$ -alkyl groups,  $-NH_2$ , substituted and  
149 unsubstituted  $-N(H)(alkyl)$  groups, substituted and unsubstituted  
150  $-N(alkyl)_2$  groups, substituted and unsubstituted

151 -N(H)-C(=O)-alkyl groups, and substituted and unsubstituted  
152 -N(H)-S(=O)-alkyl groups; or R<sup>5</sup> may be absent if A is nitrogen;

153 R<sup>6</sup> is selected from the group consisting of -H, -Cl, -F, -Br, -OH,  
154 substituted and unsubstituted heterocyclyl groups, substituted  
155 and unsubstituted -N(H)(alkyl) groups, substituted and  
156 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
157 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
158 unsubstituted alkoxy groups, substituted and unsubstituted alkyl  
159 groups having from 1 to 8 carbon atoms, substituted and  
160 unsubstituted alkenyl groups having from 1 to 8 carbon atoms,  
161 substituted and unsubstituted alkynyl groups having from 1 to 8  
162 carbon atoms, -CN, -NO<sub>2</sub>, -OH, -SH, substituted and  
163 unsubstituted -S-alkyl groups, substituted and unsubstituted  
164 -S(=O)<sub>2</sub>-O-alkyl groups, substituted and unsubstituted  
165 -S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
166 -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and unsubstituted  
167 -S(=O)-alkyl groups, substituted and unsubstituted  
168 -S(=O)-heterocyclyl groups, -S(=O)-NH<sub>2</sub>, substituted and  
169 unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and  
170 unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -C(=O)-NH<sub>2</sub>, substituted  
171 and unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
172 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
173 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
174 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
175 -C(=O)-O-alkyl groups, -NH<sub>2</sub>, substituted and unsubstituted  
176 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
177 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
178 -N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted  
179 -N(alkyl)-C(=O)-alkyl groups, substituted and unsubstituted  
180 -N(alkyl)-C(=O)-heterocyclyl groups, substituted and  
181 unsubstituted -N(H)-S(=O)-alkyl groups, substituted and

182 unsubstituted -N(H)-S(=O)-heterocyclyl groups, substituted and  
183 unsubstituted -N(alkyl)-S(=O)-alkyl groups, and substituted and  
184 unsubstituted -N(alkyl)-S(=O)-heterocyclyl groups; or R<sup>6</sup> may be  
185 absent if B is nitrogen;

186 R<sup>7</sup> is selected from the group consisting of -H, -Cl, -F, -Br, -OH,  
187 substituted and unsubstituted heterocyclyl groups, substituted  
188 and unsubstituted -N(H)(alkyl) groups, substituted and  
189 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
190 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
191 unsubstituted alkoxy groups, substituted and unsubstituted alkyl  
192 groups having from 1 to 8 carbon atoms, substituted and  
193 unsubstituted alkenyl groups having from 1 to 8 carbon atoms,  
194 substituted and unsubstituted alkynyl groups having from 1 to 8  
195 carbon atoms, -CN, -NO<sub>2</sub>, -OH, -SH, substituted and  
196 unsubstituted -S-alkyl groups, substituted and unsubstituted  
197 -S(=O)<sub>2</sub>-O-alkyl groups, substituted and unsubstituted  
198 -S(=O)<sub>2</sub>-alkyl groups, substituted and unsubstituted  
199 -S(=O)<sub>2</sub>-heterocyclyl groups, substituted and unsubstituted  
200 -S(=O)-alkyl groups, substituted and unsubstituted  
201 -S(=O)-heterocyclyl groups, -S(=O)-NH<sub>2</sub>, substituted and  
202 unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and  
203 unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -C(=O)-NH<sub>2</sub>, substituted  
204 and unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
205 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
206 unsubstituted -C(=O)-alkyl groups, substituted and unsubstituted  
207 -C(=O)-heterocyclyl groups, substituted and unsubstituted  
208 -C(=O)-O-alkyl groups, -NH<sub>2</sub>, substituted and unsubstituted  
209 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
210 -N(H)-C(=O)-alkyl groups, substituted and unsubstituted  
211 -N(H)-C(=O)-heterocyclyl groups, substituted and unsubstituted  
212 -N(alkyl)-C(=O)-alkyl groups, substituted and unsubstituted



213 -N(alkyl)-C(=O)-heterocyclyl groups, substituted and  
214 unsubstituted -N(H)-S(=O)-alkyl groups, substituted and  
215 unsubstituted -N(H)-S(=O)-heterocyclyl groups, substituted and  
216 unsubstituted -N(alkyl)-S(=O)-alkyl groups, and substituted and  
217 unsubstituted -N(alkyl)-S(=O)-heterocyclyl groups; or R<sup>7</sup> may be  
218 absent if C is nitrogen;

219 R<sup>8</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
220 substituted and unsubstituted straight and branched chain alkyl  
221 groups having from 1 to 8 carbon atoms, substituted and  
222 unsubstituted heterocyclyl groups, substituted and unsubstituted  
223 alkenyl groups having from 1 to 8 carbon atoms, substituted and  
224 unsubstituted alkynyl groups having from 1 to 8 carbon atoms,  
225 -CN, -NO<sub>2</sub>, -OH, -SH, substituted and unsubstituted alkoxy  
226 groups, substituted and unsubstituted -S-alkyl groups,  
227 substituted and unsubstituted -S(=O)<sub>2</sub>-O-alkyl groups,  
228 substituted and unsubstituted -S(=O)<sub>2</sub>-alkyl groups, substituted  
229 and unsubstituted -S(=O)-alkyl groups, -S(=O)-NH<sub>2</sub>, substituted  
230 and unsubstituted -S(=O)-N(H)(alkyl) groups, substituted and  
231 unsubstituted -S(=O)-N(alkyl)<sub>2</sub> groups, -C(=O)-NH<sub>2</sub>, substituted  
232 and unsubstituted -C(=O)-N(H)(alkyl) groups, substituted and  
233 unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups, substituted and  
234 unsubstituted -C(=O)-O-alkyl groups, -NH<sub>2</sub>, substituted and  
235 unsubstituted -N(H)(alkyl) groups, substituted and unsubstituted  
236 -N(alkyl)<sub>2</sub> groups, substituted and unsubstituted  
237 -N(H)-C(=O)-alkyl groups, and substituted and unsubstituted  
238 -N(H)-S(=O)-alkyl groups; or R<sup>8</sup> may be absent if D is nitrogen;

239 R<sup>9</sup> is selected from the group consisting of substituted and  
240 unsubstituted heterocyclyl groups, substituted and unsubstituted  
241 aryl groups, substituted and unsubstituted alkoxy groups, -NH<sub>2</sub>,

242 substituted and unsubstituted cycloalkyl groups, and substituted  
243 and unsubstituted straight and branched chain alkyl groups  
244 having from 1 to 8 carbon atoms, or R<sup>9</sup> and R<sup>10</sup> join together to  
245 form a ring having 5, 6, or 7 ring members; and

246 R<sup>10</sup> is -H, or R<sup>9</sup> and R<sup>10</sup> join together to form a ring having 5, 6,  
247 or 7 ring members.

1 55. The method of claim 54, wherein the serine/threonine  
2 kinase is glycogen synthase 3

1 56. The method of claim 54, wherein

2 R<sup>1</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
3 and straight and branched chain alkyl groups having from 1 to 8  
4 carbon atoms; or R<sup>1</sup> may be absent if W is nitrogen;

5 R<sup>2</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
6 -NO<sub>2</sub>, -CN, -NH<sub>2</sub>, -CO<sub>2</sub>H, -OH, straight and branched chain alkyl  
7 groups having from 1 to 8 carbon atoms, substituted and  
8 unsubstituted cycloalkenyl groups, substituted and unsubstituted  
9 cycloalkyl groups, substituted and unsubstituted alkoxy groups,  
10 substituted and unsubstituted -N(H)(alkyl) groups, substituted  
11 and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
12 unsubstituted heterocyclyl groups, and substituted and  
13 unsubstituted aryl groups; or R<sup>2</sup> may be absent if X is nitrogen;

14 R<sup>3</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
15 -OH, straight and branched chain alkyl groups having from 1 to  
16 8 carbon atoms, substituted and unsubstituted alkoxy groups,  
17 -CO<sub>2</sub>H, -CN, substituted and unsubstituted -N(H)(alkyl) groups,  
18 substituted and unsubstituted -N(H)(cycloalkyl) groups,

19 substituted and unsubstituted -N(alkyl)<sub>2</sub> groups, substituted and  
20 unsubstituted heterocyclyl groups, substituted and unsubstituted  
21 aryl groups, substituted and unsubstituted -C(=O)-heterocyclyl  
22 groups, substituted and unsubstituted -C(=O)-alkyl groups,  
23 substituted and unsubstituted -C(=O)-N(H)(alkyl) groups,  
24 substituted and unsubstituted -C(=O)-N(alkyl)<sub>2</sub> groups,  
25 -C(=O)-NH<sub>2</sub> groups, substituted and unsubstituted  
26 -C(=O)-N(H)(heterocyclyl) groups, and substituted and  
27 unsubstituted -C(=O)-N(H)(aryl) groups; or R<sup>3</sup> may be absent if  
28 Y is nitrogen;

29 R<sup>4</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
30 and straight and branched chain alkyl groups having from 1 to 8  
31 carbon atoms; or R<sup>4</sup> may be absent if Z is nitrogen;

32 R<sup>5</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
33 straight and branched chain alkyl groups having from 1 to 8  
34 carbon atoms, and substituted and unsubstituted heterocyclyl  
35 groups; or R<sup>5</sup> may be absent if A is nitrogen;

36 R<sup>6</sup> is selected from the group consisting of -H, -Cl, -F, -Br, -OH,  
37 substituted and unsubstituted heterocyclyl groups, substituted  
38 and unsubstituted -N(H)(alkyl) groups, substituted and  
39 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
40 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
41 unsubstituted alkoxy groups, and substituted and unsubstituted  
42 alkyl groups having from 1 to 8 carbon atoms; or R<sup>6</sup> may be  
43 absent if B is nitrogen;

44 R<sup>7</sup> is selected from the group consisting of -H, -Cl, -F, -Br, -OH,  
45 substituted and unsubstituted heterocyclyl groups, substituted

46 and unsubstituted -N(H)(alkyl) groups, substituted and  
47 unsubstituted -N(H)(heterocyclyl) groups, substituted and  
48 unsubstituted -N(alkyl)(heterocyclyl) groups, substituted and  
49 unsubstituted alkoxy groups, and substituted and unsubstituted  
50 alkyl groups having from 1 to 8 carbon atoms; or R<sup>7</sup> may be  
51 absent if C is nitrogen; and

52 R<sup>8</sup> is selected from the group consisting of -H, -F, -Cl, -Br, -I,  
53 straight and branched chain alkyl groups having from 1 to 8  
54 carbon atoms, and substituted and unsubstituted heterocyclyl  
55 groups; or R<sup>8</sup> may be absent if D is nitrogen.

1 57. The method of claim 54, wherein R<sup>10</sup> is -H and R<sup>9</sup> is  
2 selected from the group consisting of substituted and unsubstituted  
3 heterocyclyl groups, substituted and unsubstituted aryl groups, substituted  
4 and unsubstituted alkoxy groups, -NH<sub>2</sub>, substituted and unsubstituted  
5 cycloalkyl groups, and substituted and unsubstituted straight and branched  
6 chain alkyl groups having from 1 to 8 carbon atoms.

1 58. The method of claim 54, wherein R<sup>1</sup> is selected from the  
2 group consisting of -H, -F, -Cl, and -CH<sub>3</sub> groups.

1 59. The method of claim 54, wherein R<sup>2</sup> is selected from the  
2 group consisting of -H, -Cl, -F, -Br, -I, -CH<sub>3</sub>, -NO<sub>2</sub>, -OMe, -CN, -CO<sub>2</sub>H,  
3 substituted and unsubstituted 1,2,3,6-tetrahydropyridine groups, substituted  
4 and unsubstituted thiophene groups, substituted and unsubstituted imidazole  
5 groups, substituted and unsubstituted 3-pyridyl groups, substituted and  
6 unsubstituted 4-pyridyl groups, 2-substituted phenyl groups, 2,4-disubstituted  
7 phenyl groups, 4-substituted phenyl groups, 3-substituted phenyl groups, 2,6-  
8 disubstituted phenyl groups, phenyl, substituted and unsubstituted  
9 dialkylamino groups, and substituted and unsubstituted alkylamino groups.

1                    60.    The method of claim 54, wherein R<sup>6</sup> and R<sup>7</sup> are  
2 independently selected from the group consisting of -H, -F, -Cl, -OH, and  
3 substituted and unsubstituted heterocyclyl groups.

1                    61.    The method of claim 54, wherein A, B, C, and D are all  
2 carbon, and R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>10</sup> are all -H.

1                    62.    The method of claim 54, wherein the IC<sub>50</sub> value of the  
2 compound is less than or equal to 0.1 μM with respect to glycogen synthase  
3 kinase 3.

1                    63.    A compound, a tautomer of the compound, a  
2 pharmaceutically acceptable salt of the compound, a pharmaceutically  
3 acceptable salt of the tautomer, or mixtures thereof wherein the compound is  
4 selected from one of the title compounds of Examples 51-90, Examples 93-  
5 100, Example 102, Example 104, Example 105, or Examples 339-1457, or  
6 mixtures thereof.

1                    64.    A method of inhibiting a serine threonine kinase or a  
2 tyrosine kinase or treating a biological condition mediated by the serine  
3 threonine kinase or the tyrosine kinase, comprising administering the  
4 compound of claim 63 to a subject.

1                    65.    The use of the compound of claim 63 in the manufacture  
2 of a medicament for inhibiting inhibiting a serine threonine kinase or a tyrosine  
3 kinase or treating a biological condition mediated by the serine threonine  
4 kinase or the tyrosine kinase.

1                    66.    The compound of claim 63, wherein the compound is  
2    selected from those listed in Table 3, those listed in Table 4, or those listed in  
3    Table 5.

1                    67.    A method of inhibiting a serine/threonine kinase in a  
2    subject or treating a biological condition mediated by the serine/threonine  
3    kinase in the subject, comprising: administering to the subject a compound, a  
4    tautomer of the compound, a pharmaceutically acceptable salt of the  
5    compound, a pharmaceutically acceptable salt of the tautomer, an enantiomer  
6    or diastereomer of the compound, an enantiomer or diastereomer of the  
7    tautomer of the compound, a pharmaceutically acceptable salt of the  
8    enantiomer or diastereomer, a pharmaceutically acceptable salt of the  
9    enantiomer or diastereomer of the tautomer, or mixtures thereof wherein the  
10   compound is selected from one of the title compounds of Examples 51-90,  
11   Examples 93-100, Example 102, Example 104, Example 105, Examples 339-  
12   1457, or mixtures thereof.

                    68.    The compound of claim 67, wherein the compound is  
selected from those listed in Table 3, those listed in Table 4, or those listed in  
Table 5.